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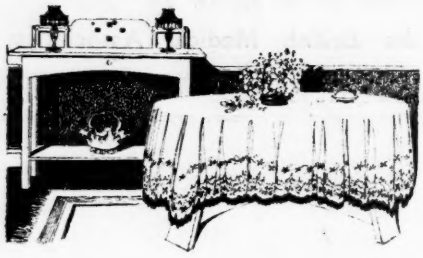

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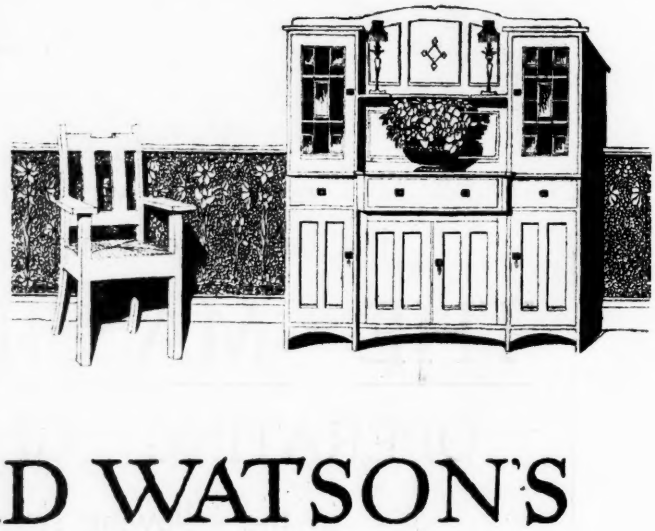

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SOME DIRECTIONS IN WHICH ADVANCES IN PREVENTIVE MEDICINE COULD BE MADE IN QUEENSLAND.[1]

BY W. A. SAWYER, M.D.,

Senior State Director, International Health Board, Rockefeller Foundation; Director, Australian Hookworm Campaign.

IT is my purpose in this communication to bring before the Queensland Branch of the British Medical Association for discussion a proposed modification of the work of the Hookworm Campaign and also to comment briefly on a few other problems of sanitation.

The Hookworm Campaign.

The hookworm survey of Australia and its dependencies is nearing completion and the infected areas within the Commonwealth are gradually being covered by intensive control methods. Some heavily infected areas are even being gone over the second time. As the areas favourable to the spread of hookworm disease have been mapped out, it would seem advisable to institute at this stage of the work a broad, inexpensive plan for systematic control in such areas, with the intention that the plan shall be permanent or shall at least be the starting point from which the ideal plan of the future will evolve. By commencing now we can make sure that the plan will be in full operation when the present Hookworm Campaign ends on September 30, 1924, and that the expensive stage of intensive operations on a large scale will have been passed.

The change from the present procedure of the Hookworm Campaign will be more in point of view and organization than in methods of work. The emphasis will be placed more than heretofore on continuity of control, rather than on intermittent intensive campaigns, and on the cooperation of the permanent health agencies, Commonwealth, State and local, and also of the State Department of Public Instruction.

The Hookworm Index.

To secure the maximum public benefit from hookworm control it will be necessary to adapt the methods to local conditions, the most important of which are the prevalence and severity of the infection. These are in general proportional to the percentage of infected persons in the population. To determine this percentage at intervals sufficiently frequent for the purposes of systematic control would involve the continuous employment of a considerable staff. It is believed that sufficient infor-

[1] Read at a meeting of the Queensland Branch of the British Medical Association on October 7, 1921. The work on which this paper is based was conducted with the support and under the auspices of the Commonwealth of Australia, the International Health Board of the Rockefeller Foundation and the State of Queensland.

mation could be obtained at much less expense by the determination of a hookworm index for each community, by computing it from the results of the periodic examination of the most accessible and most heavily infected part of the population, the school children. It is proposed, therefore, to determine the kind and amount of hookworm work which is to be done under the plan in each community in which hookworm infection has previously been found in the general survey, on the basis of a hookworm index ascertained as follows:

At regular intervals, usually annually, the school children of the school year in which the average age is about eight years, will be examined for hookworm infection by the microscopic search for hookworm ova in specimens of their fæces. From the percentage of children found to have hookworm infection will be computed the hookworm index (or percentage infection rate) of the general population of the area in which the children reside.

The percentage of infection in school children will tend among the white population to be distinctly higher than the percentage of infected persons in the district (the hookworm index), as the barefooted children are much more exposed to infection than the shoe-wearing adults. In fact, the percentage of infection among Australian school children has been found in a number of areas to be almost double that of the general population. The estimation of the infection rate of the general population, from the results of the examinations of school children, can be readily made by use of the table shown below. This table is based on the examination of a series of 9,392 white persons in Queensland in the Bowen and Nambour districts of the Hookworm Campaign.

Table for Use in Estimating the Hookworm Index of Australian White Communities.

Age or Age Group of Persons Examined.	Multiply Infection Rate by Factor Below to Obtain Index.
6	0.88
7	0.79
8	0.72
9	0.64
10	0.59
11	0.53
12	0.49
13	0.46
14	0.43
15	0.42
16	0.44
17	0.50
18	0.58
8 to 12	0.57
6 to 18	0.57
All ages	1.00

To illustrate the use of the table, consider a group of white school children of the approximate age of eight years, in which 20% are found to be infected with hookworms. The hookworm index, or estimated infection rate for all ages in the same community, would be 0.72 times 20 or 14.4. On the other hand, if the group ranged fairly evenly between the ages of eight and twelve years and the infection rate was 20%, the estimated infection rate for the whole community would be 0.57 times 20 or 11.4. The table would apply only to white communities where conditions are comparable with those in Queensland.

The benefit of the examination and the treatment of school children in connexion with the determination of the index would be considerable, as they are the part of the population most exposed to infection, most injured by hookworm disease and most helped by its discovery and treatment.

Where the infection rate is very low, it will often be necessary to correct the rate by excluding from the computation persons obviously infected away from the area under investigation. This will be important in areas almost free from endemic hookworm disease, but situated near areas having a high infection rate.

The method of making the microscopic examinations for determining the index should be uniform, so that comparisons of statistics will be reliable. It is probable that the standard technique decided upon after further trial will be a simplified salt-flotation test. At the beginning the index can be taken from the records of the original surveys and intensive operations of the Hookworm Campaign.

Methods Employed.

On the basis of the hookworm index all territory in Australia would be classified under the plan as follows:

Class 1.—Index, 0 to 0.9. No endemic hookworm disease.
Class 2.—Index, 1 to 4.9. Very light infection.
Class 3.—Index, 5 to 9.9. Light infection.
Class 4.—Index, 10 to 19.9. Moderate infection.
Class 5.—Index, 20 to 49.9. Heavy infection.
Class 6.—Index, 50 to 100. Very heavy infection.
Class 7.—Groups requiring special measures. Territories of Papua and late German New Guinea and settlements of Australian aborigines having a high infection rate.

The ambulatory field unit, which determines the annual hookworm index, should also carry out the following control work in cooperation with the local Medical Officers of Health and school authorities.

All persons found infected should be treated twice, with a week's interval between. The members of the households of children found infected should be examined and their latrines inspected. A temporary dispensary should be opened where any person could be examined for hookworm disease and treated if infected. In cooperation with the local Medical Officer of Health a latrine survey should be made. School talks and public lectures illustrated with charts, lantern slides or moving pictures should be given and an effort should be made to create a community ambition to rise to a better classification under the hookworm index. Through personal interviews or group conferences the cooperation of local practitioners and public health workers should be specially sought after, so that the greatest possible improvement will be brought about before the next index is taken.

The frequent instruction of school children residing in infected areas concerning the dangers of soil pollution and the methods by which hookworm disease can be avoided, is a most important part of the programme and requires the cooperation of the State

Department of Public Instruction. The plan includes the following instruction in schools in infected areas, in addition to that in connexion with the taking of the index and the intensive operations of the Hookworm Campaign. Of course, this plan will be submitted to the Department of Public Instruction for modification and approval.

There should be made available to teachers and pupils a paper-covered pamphlet which will serve as a text-book on the need for good sanitation in general, the dangers of soil pollution, the specifications of adequate privies and the responsibilities of the child for preventing hookworm disease. There should be also a brief leaflet for more general distribution to children, parents and others. Four times during the school year there should be a special lesson or series of lessons on public health and the prevention of hookworm disease.

The measures necessary for each class of territory are tentatively fixed as shown by the table given below.

The Special Problem of the Native.

In working among natives of Papua and Australian aborigines, included in Class 7, special methods are necessary. These special methods consist usually of an initial survey by the Hookworm Campaign of representative groups of people in communities in all the major subdivisions of the area under investigation. This survey permits the mapping of the country according to the distribution of the several grades of infection. During the survey illustrated talks are given to the natives by white or native lecturers and treatment is administered. An attempt is made to prevent soil pollution and to start the demand for some suitable form of latrine, even in the villages. On plantations, mission stations, government settlements and in other places where the natives are under the influence and control of competent white persons the installation of latrines is brought about through persuasion and Government regulation. In such places, if the infection rate is above 50%, arrangements are often made and in some instances are required by Government regulation that the natives should be given a routine treatment once every six months to minimize the physical injury from infection with hookworms and other intestinal parasites until control measures become effective. Under these conditions arrangements can usually be made by which the Hookworm Campaign furnishes the drugs and printed directions on condition that regular reports shall be made with regard to the treatment and that the control work shall be under the supervision of the chief Government Medical Officer. Areas would be allotted to Class 7 only when intensive control operations are clearly not practicable.

To determine the hookworm index and to carry on the accompanying educational and control measures there would probably be required a medical officer, a school nurse, a microscopist and a field inspector. It is proposed that the medical officer be in general charge of the survey and be a part of the regular staff of the base laboratory and divisional executive office of the Commonwealth Department of Health at Townsville. The microscopist and inspector would be his direct subordinates and could be assigned from the staff of the Hookworm Campaign. The school nurse, it is hoped, will be furnished by the State Department of Public Instruction as a measure of cooperation. It is con-

Class.	Index.	Survey.	Control Measures.	Special Education.
1.	0 to 0.9	Original survey only, unless changed conditions require re-survey	None	None
2.	1.0 to 4.9	Annual index taking. At beginning, survey with intensive control only where gradual methods would be inadequate.	Control measures with index taking as described above. Intensive control in special instances.	Educational measures with index taking as described above and with intensive control measures. Educational work in the schools as described above.
3.	5.0 to 9.9	Survey with intensive control at beginning and every three years. Index taken in other years.	Intensive control at beginning and every three years. Control measures with index taking in other years.	As for Class 2
4.	10.0 to 19.9	As for Class 2, except intensive control repeated every two years	As for Class 2, except intensive control repeated every two years	As for Class 2
5.	20.0 to 49.9	Survey with intensive control or "follow-up" work each year	Intensive control or "follow-up" work each year	Education measures with intensive control. Educational work in the schools as described.
6.	50.0 to 100	As for Class 5	As for Class 5	As for Class 5
7.	——	Initial survey by Hookworm Campaign	Cooperate with officials, employees, mission superintendents and others as described	Special educational measures during survey and afterward through cooperation as explained

templated that such a team will be able to visit in each year as many communities as may be necessary for the work of hookworm control. It would ordinarily be involved in investigations only in areas in Classes 2, 3 and 4 and the investigations in areas in Classes 3 and 4 would not be needed in years when intensive operations are in progress.

The team which determines the hookworm index would be the beginning of the permanent organization under the Commonwealth Department of Health, working in cooperation with the States, which would prevent hookworm disease from again becoming prevalent in any part of the Commonwealth. The present Hookworm Campaign is the larger, temporary organization created for the purpose of determining conditions with regard to hookworm infection and making a rapid fight to bring the incidence of the disease down to a point at which it will cease to produce noticeable deleterious effects on health and at which it can be kept by continuous control measures of moderate cost.

The plan as presented will furnish a simple basis for the more exact measurement of the successes and failures of the Hookworm Campaign in Australia and will also establish a procedure for the control of the residual infection after the greatest possible benefit has been derived from intensive methods.

Inherent in the plan outlined above is the system of mapping the State into zones having common problems and then concentrating the principal attack on the most serious menace in each zone. Endemic hookworm disease is limited sharply to certain areas and malaria appears to involve a distinctly smaller region. It would be wasteful to preach hookworm and malaria control in the dry interior to the neglect of the health problems peculiar to that region, as, for example, eye infections associated with the fly nuisance. Differences of temperature, rainfall and density of population determine to a large extent the predominant preventible diseases and the practicability of effective control measures.

It should be our aim to give to the children and the general public specific and useful information about the prevention of the diseases which threaten them most in the zones in which they live. The cost of such instruction should not all fall on one place. Where the problem is wide-spread in Australia, or of importance to the nation as a whole, it would seem reasonable to expect the Commonwealth Health Department to furnish at least part of the printed matter distributed and for the State Health Department and the State Department of Public Instruction to participate systematically in the propaganda for better health. Unofficial agencies, such as the Public Health Association of Australasia and the British Medical Association, should help with their influence.

Milk Supply.

The problems which have been mentioned, are primarily rural, but the cities have their troubles also. The difficulties of securing safe milk and water in abundance and of disposing of sewerage are tremendous and are overcome only by elaborate organization, abundant capital and incessant supervision by governmental health departments. The milk supply of Brisbane is admittedly not what it should be in a large city, but the outlook for improvement is bright, for a committee of the Food and Drugs Section of the Public Health Association of Australasia is already at work to decide on standard methods and a plan of action. The committee includes representatives of the producers, distributors and consumers, as well as practitioners, analysts, bacteriologists and persons interested in child welfare.

I cannot avoid a suspicion that a considerable part of the bacillary dysentery, typhoid fever and diarrhœa, for which the fly is popularly blamed, is due to direct contamination of milk or other food and sometimes drinking water, by disease carriers and persons actually sick. In the absence of definite evidence we can only draw conclusions from the excessive amount of these diseases observed and the frequency with which the soiled human hand is seen in contact with the market milk supply. The correction of the present conditions with regard to milk would undoubtedly make a considerable saving in infant and child life.

General Sanitation.

The relationship of water supplies and sewerage to the public health is too well known to need repetition. In fact, the sanitary engineer, on account of his expert knowledge in matters of water supplies and sewage disposal, is beginning to be regarded as indispensable to the staffs of the larger health departments. Through arrangement with the International Health Board, the Commonwealth Department of Health will shortly have a sanitary engineer on its staff and I hope that Queensland will be able to secure his early assignment to an investigation of sewerage problems and water supplies in the northern part of the State. Even a short study of the problems of tropical Queensland would probably save many lives and also much money which might otherwise be wasted in ill-considered projects.

It would be a pity to leave the subject of water supplies without mentioning the unprotected water containers and the common cup found in many public places. I have seen an unkempt but highly economical individual draw water from the container in a crowded railway station, drink from the common cup and pour the remainder into the open top of the container. Drinking water should not be stored where it is so exposed to pollution by the careless, the thoughtless and the ignorant; the common cup should be abolished in favour of the drinking fountain, the paper cup or the cup carried by the individual.

There are many other problems in Queensland which could be mentioned, but they are already well known to the Queensland Branch of the British Medical Association and its public health committee. Most of them could be solved in whole or in large part by the cooperation of agencies already in existence, including the Commonwealth and State Health Departments, the Public Health Association of Australasia, the public health committee of this Branch of the British Medical Association and the practising physicians.

A REVIEW OF THE COURSE AND TREATMENT OF CARCINOMA UTERI.[1]

BY A. NORMAN MCARTHUR, M.B., B.S. (MELB.), M.R.C.S. (ENG.), L.R.C.P. (LONDON),
Senior Gynæcological Surgeon to In-Patients, St. Vincent's Hospital, Melbourne.

Foreword.

IN presenting a paper before you to-night I have avoided giving you anything of the nature of a classic account on the subject. I have excluded all that can be read in the text-books and the information there is obtainable by you all. I have preferred to give my own experience, which now is a fairly ripe one. Many of my statements are matters of fact and are irrefutable. The rest are conclusions I have come to on the evidence before me. My conclusions so deducted may be wrong, but I have been much influenced in arriving at such conclusions. I hope that there will be a full discussion and that I shall gain much information from what you all may be able to say about this subject. You will notice that there are only two methods of treatment with which I deal. The rest, as for instance the use of various escharotics, strong antiseptics, alleged solvents and the thermo-cautery, are not mentioned, for to my mind they are fantastic, harmful and ineffective and can only be used to diminish some disadvantageous symptom until a more radical treatment can be adopted.

In reviewing this subject after an experience extending over twenty-two years, I am afraid the result is not flattering, either to the general practitioner or to the specialist. On behalf of the specialist I can say that he is hampered tremendously by the lack of diagnostic acumen displayed by the general practitioner. Many years ago I was surprised at the number of cases sent to me that were quite inoperable. After many years of teaching of the early diagnosis of these cases and the full exploitation of this fell disease, we do not seem to have arrived one step in advance. In every country in Europe and America philanthropists have come forward with big financial schemes to establish institutions for cancer research led by the first scientists on this particular subject. So far as I can see, the pathology and ætiology of cancer are still shrouded in mystery. A multiplicity of theories only demonstrates how far away these scientists are from finding the real cause of cancer. We have always known that if this disease be attacked early by a radical extensive surgical operation, it may be eradicated for ever. But we find that those who have the opportunity of diagnosing this dreadful complaint at an early stage, fail to do so and the specialist receives the patient in 90% of cases when the condition is inoperable. I quote only from my own experience. In the last two years, both in public hospitals and in private practice, all the patients I have seen have passed beyond the stage when operation can be of avail. Many of these women have been under continuous supervision by general practitioners. I am therefore forced to the conclusion that these medical men do not realize their grave responsibility or at any rate have not learnt the necessity of careful investigation when slight symptoms in the "cancerous age" of women indicate the possibility of this disease being present. Within the last twelve months a woman who had been under the supervision of her medical adviser came to St. Vincent's Hospital with an inoperable cancer. She had been bleeding irregularly with floodings at times during these twelve months and yet no careful examination had been made to discover the cause. When she was sent to me it was too late to do anything remedial in a surgical way. This case is not by any means an isolated one; in fact, it is quite typical of the class of case that is sent to me at the public hospital. I cannot say that it is quite so constant with private patients; but surely a life is a life, whether the patient be poor or rich.

Now, wherein lies this fault? Is it because of the so-called contract practice or, as we know it, a lodge practice, where men are paid a miserable wage *per annum* to look after these poor people, lose their initiative and become callous to the slight symptoms indicative of early cancer? I hope that none of my students ever go out in practice and forget the ideals that I endeavour to inculcate in them. I inform them that, no matter what the age of a woman may be, no irregular bleeding or excessive bleeding should be left without the most careful investigation. More particularly so about the climacteric, in what we may call a "cancerous age." But in all cases, no matter what the age of the patient, irregular hæmorrhage should be investigated most thoroughly until it is absolutely certain that cancer is not present.

Let me quote an instance. A woman, aged 27 years, came to me when I was in the out-patient department at St. Vincent's Hospital, saying almost apologetically that there was nothing wrong with her, but that her husband had insisted upon her asking my advice. She told me that, after the three last connexions with her husband there was a slight loss of blood amounting in her mind to nothing, but her husband knew it was not natural. When she told me, it made but little impression upon my mind, but I made a vaginal examination and found that she had a very extensive, inoperable cancer of the neck of the womb and the whole of the pelvis was *en plaque*. She died within three months.

Again, another patient in high social life appealed to me because, since the climacteric, she had slight irregular bleeding during a period of two years. That was the first intimation I had of it; she had said nothing, because her lady friends had told her that irregular bleeding during the climacteric was quite a natural thing. She had an adeno-carcinoma of the body of the uterus with metastasis in the pelvic glands and the vaginal wall. I did a panhysterectomy; there was complete recurrence in the pelvis and death within three months. Irregular bleeding is the earliest and the most important sign of *carcinoma uteri*. All patients with irregular bleeding should be examined thoroughly and immediately. Nineteen of them may be free from carcinoma, with no obvious cause producing the bleeding, but the

[1] Read at a meeting of the Melbourne Gynæcological and Obstetrical Society on July 28, 1921.

twentieth will have malignant disease. With careful investigation it will reward you by finding that you have operated in time to give the prospects of a permanent result. These cases cannot be operated on too early. I remember many years ago a woman had some trifling, irregular bleeding; I curetted and found an endometritis quite sufficient to cause the bleeding. The cervix, however, was hypertrophied and looked a little ugly. While doing a trachelorrhaphy I preserved a section, which I sent to the pathologist and he reported very early epitheliomatous ingrowths and nests. On the night of the eighteenth day I was informed by telephone that she had a severe hæmorrhage; at two o'clock in the morning, to my house surgeon's surprise, I did a Wertheim's panhysterectomy. She is, I believe, still alive and well.

Wertheim's Operation.

How many Wertheim's operations give us a permanent result? Three years is not long enough; I have seen recurrence six years later. In teaching the students we must admit there is a cancerous age, but we should not lay stress upon it, for I have seen three cases of *carcinoma uteri* in women under twenty-seven years of age. I have seen quite a number in women between thirty and thirty-five. Yet some of the text-books tell us that it is a disease attacking only those of forty-five years of age and upwards. I have frequently heard medical men say that a patient could not have cancer because there was no cachexia and the patient was so stout and healthy looking and had not lost weight. I have at present six patients with inoperable cancer who are being treated by radium; not one of them has lost weight, not one shows cachexia and all look healthy and robust. Only few patients whom I have seen are cachectic and very few in whom there has been marked loss of weight. If that be so, then surely our previous teachings to students is very misleading. Again, many medical men say that a patient could not have *carcinoma uteri* because she did not suffer pain. When it occurs, pain usually means that the cancer is so advanced that nothing on earth can be done to save her. I have seen so many advanced cases in which there is no pain at all and it is only when the condition becomes still more advanced, involving the vital viscera or entangling the pelvic nerves in its progressive growth that pain is felt; that is nearly always towards the end. A well-known and experienced practitioner brought to me a woman the other day in whom he had diagnosed a cancer of the body of the uterus. He could feel the uterus was enlarged; there had been some slight, irregular bleeding and there was marked pelvic pain. The pain had influenced his diagnosis. The condition was hæmatosalpinx, probably an old ectopic gestation, the bleeding being congestive from the pressure of the mass.

If I may now recapitulate in the first section of my paper, I will accentuate the points that I hope I have already made clear:

Age Limit.—Any time in adult life.

Hœmorrhage.—Irregular vaginal bleeding, excessive or slight, should thoroughly be investigated until proved whether a malignant growth is present or not.

Cachexia.—I insist upon asking you to put right out of your minds that the absence of cachexia is incompatible with malignant disease. It is an extremely dangerous basis to work on in cervical carcinoma; particularly when the drainage is so good, there is practically no toxæmia. If present, it is usually a few weeks before death.

Pain.—In all my cases pain has been an extremely late symptom, indicating that the patient is nearing the end and a long way past operability and treatment. Until quite recently no other treatment was devised, but complete removal of the infected parts, which are usually the surrounding connective tissues, lymphatics and glands of the pelvis, by direct continuity the bladder and to a less degree the rectum.

You will realize that an operation devised for the cure of this condition had to start with the knowledge that everything that could possibly be infected, had to be removed. Working on this hypothesis, Wertheim invented his extensive panhysterectomy. I shall not describe the operation; it would be an insult to you all. The only thing with which some men seem to have difficulty, is the ureter when the surrounding tissues about the neck of the womb are saturated with cancer and inflammatory thickening, as that portion of the ureter embracing the neck of the womb, loses its identity in this mass. The suggestion of course is to find the ureter as it crosses the iliac vessels into the true pelvis, to open the peritoneum there and to split it down towards the cervix. The ureter will be found lying on the outer side of the inner flap of the peritoneum.

The anterior portion of the ureter embracing the neck of the womb is markedly adherent, held down in position by inflammatory thickening and carcinomatous cell growths. Usually in these advanced cases of malignant disease of the cervix the digging out of the ureter is the most difficult part of the whole operation and usually another difficult part is the peeling down of the bladder wall. The next very important part is the stripping down of the vagina as far as possible. I have almost given up using Wertheim's forceps and I use a kind of silk purse-string stitch both above and below and cut in between. In malignant growths of the cervix I consider a vaginal hysterectomy an improper surgical procedure. It becomes almost an impossibility to prevent direct contamination of the incised vaginal wall with the malignant cervix. If, however, the whole of the vagina be dissected out, the cervix could be prevented from contaminating the wound, but if there be any adhesions of the ureter to the cervix, it makes the operation very difficult. Moreover, in complete enucleation of the vagina there is frequently a lot of bleeding that is difficult to find and arrest. But a serious indictment against vaginal hysterectomy is the fact that the pelvis cannot be cleared of the lymphatics and glands, fat and connective tissue all bearing cancer cells. There may be something to be said in favour of vaginal hysterectomy for early cancer of the body of the uterus, but personally I always prefer to do a Wertheim's operation when everything is under my observation and any remote pelvis metastasis can be attacked. In these advanced cases for which

a Wertheim's operation has been done, the two ureters are seen slung across the pelvis like two wires across a valley. The blood supply of the ureters is poor and when they have been dug out from the cervix, they may become more or less bruised and ultimately a portion of the ureter becomes necrosed and a uretero-vaginal fistula will arise. Quite half a dozen of these fistulas have followed an extensive Wertheim's operation, but in all cases the fistulous opening has automatically healed up in three or four weeks. As I have said in an earlier part of my paper, these difficult cases of fairly advanced malignant disease of the cervix unfortunately give an unsatisfactory percentage of recurrences and it is only in latter years that we have called to our aid Röntgen rays or radium.

Radium Treatment.

For various reasons I have not persisted with Röntgen rays; it is extremely unsuitable for vaginal cases, the technique for application is very exacting, the apparatus is not portable, the patient must be protected from high tension shocks and the rays are far less penetrating than radium rays.

Radium, on the other hand, is so easy to handle, is so easily portable and has a more penetrating effect. It does not deteriorate, but, of course, it is extremely costly. With radium I feel in subsequent surgical work I have had the strongest ally. Frequently it will render an apparently hopeless, inoperable case operable. It will reduce pain, check the bleeding and diminish an offensive odour. It reduces surrounding inflammatory thickening and sterilizes outlying cancer cells. It will clear away completely a cauliflower growth of the cervix and in some cases will produce a normal appearance of a uterus that at one time looked hopeless. But up to now we distrust its lasting effect.

If I quote one or two cases that I have had, it will give you an idea of what I mean.

A woman from Romsey, aged 47, was treated at the hospital with radium. She had an extensive cauliflower growth of the cervix. When she appeared in three months' time for another treatment by radium, there was no sign of malignant growth of the cervix at all. Then three months after she had her three treatments and the uterus and cervix had assumed by this time their normal appearance and it certainly looked as if the result was a perfect cure. Two and a half months later she wrote to me and said there was a little vaginal bleeding. I told her to come down post haste to me. I discovered an extensive malignant ulceration of the neck of the womb and a heavy, offensive smell. The whole thing had lit up like a bush fire. I did a Wertheim's panhysterectomy with extreme ease and wherever there had been old inflammatory tissue, the radium had seemed to gelatinize it. There were no adhesions of the ureters. Before leaving the hospital I gave the vaginal fornix a treatment with the radium and I believe she is now keeping well.

Another patient was sent to me from Beechworth, aged 67, with very advanced malignant disease of the cervix and great pelvic pain. For weeks she had been incapable of walking. She was brought in in an ambulance. There was advanced malignant disease of the cervix with fixation of the uterus and pelvic inflammation *en plaque*. She was given a treatment in January; since then she has been able to get about with comfort and has very little pain. I saw her again in April. Very little change had taken place in the surrounding condition of the uterus and a certain amount of improvement in the malignant condition of the neck of the womb, but her general condition was infinitely better.

In some cases of malignant disease in old women, when under any circumstances they could not be expected to live long, I have elected not to subject the patients to a big operation, probably inviting a fatality, but now prefer to treat with a series of doses of radium. You will understand, however, that this trial of radium is an extremely severe test. In the first place, the malignant condition is inoperable; in the second place, owing to the woman's age, she has not the same resisting powers. Up to the present moment I have used radium by directly applying a piece within the cervix. Frequently there has been great difficulty in getting the radium to pass into the cervix. In future I shall insist that every patient who is to have the radium, will have it inserted well into the cervix, even if I have to administer an anæsthetic. All these cases in which I was able to get the radium inserted into the cervix, gave much better results than those in which it was applied only partially in the cervix. In dealing with radium the fact should always be borne in mind that intensity decreases as the square of the distance. For instance, a tube one millimetre from a diseased spot will give a certain dose; place the tube ten millimetres from the surface and give it the same time, you will not get one tenth of the dose but one hundredth.

The radium is contained in silver tubes 0.75 mm. to 1 mm. in thickness and these are put into india-rubber coverings 3 mm. in thickness. These india-rubber coverings are to prevent burning by the secondary rays produced in the metal tubes. The usual method is to apply one piece of radium in the cervix, one at each lateral fornix and one—the bigger bulb—pressed up against the cervix. The first dose is 1,500 milligramme hours, placed in for twenty-four hours only. The rays used are the hardest β and γ rays. The second treatment is 2,400 milligramme hours, applied for forty-eight hours with more protection, so as to produce a more distant effect and to cut off all except the γ rays. You will therefore notice that the advice of the radium expert is very necessary to the surgeon, who may not have the expert knowledge of the use or danger of radium and, moreover, the radium specialist does not undertake treatment of gynæcological cases, but is merely adviser to the gynæcologist who applies the treatment. There is generally a great improvement in the parts after this treatment and in about ten days' time a second application is given and applied for forty-eight hours, the metallic screening being heavier. The dosage is 3,000 to 4,000 milligramme hours.

Mayo Robson tells us that radium destroys cells at a certain distance, so that their reproduction is checked and connective tissue is caused to develope, which acts as a barrier to the further extension of

the malignant process. I am surprised to hear his suggestion that connective tissue is developed. My experience, as I have said before, is that radium seems to gelatinize any connective tissue with which it may have come in contact.

Redaseus says to avoid serious infection, he treats the cancer with a 1% solution of copper sulphate before applying the radium; he douches the vagina with a 1% solution. Of course, we realize that there are different forms of cancer which are less amenable to treatment by radium. But the papillary form of cancer is more demure.

Now, the last part of my paper I consider is by far the most important. We have here in our hands a means of curing some forms of cancer, a means of improving the condition of other forms of cancer, at any rate for a certain time, a means which, if not curative, at any rate will alleviate in some forms of cancer many of the most distressing symptoms, pain, bleeding and hæmorrhage. Associated with surgery it is the greatest ally surgeons have ever had in those dreadful cases. The price of radium limits its purchase to a fortunate few who are sufficiently wealthy to invest in its purchase. I do not really know how many of the public hospitals have a supply. I believe the Women's Hospital has purchased a certain amount, but not enough to make extensive observations and to help the indigent poor. We are entirely dependent upon the graciousness of a practitioner to lend his own private supply for hospital use. When radium is being taken to the public hospitals from time to time, there is always a risk of it being lost or stolen. It would be a great monetary loss to the owner. Had it not been for the gracious and kindly help of Dr. Herman Lawrence, I should have had no opportunity of making these investigations. He never failed me; he regulated the dosage and he indicated where best to apply the different parts of radium. We generally arrange for week-ends to apply radium, when he is not so likely to require his supply as he would during the other days. I cannot say enough about the kindness and generous help which Dr. Lawrence and with him his assistant, Dr. Colquhoun, have always given me.

But here comes my final point. It is not right that we should have to apply to medical men to help us at the general hospitals with their own private supply. There should be a central supply available for all the hospitals financed by the Government and under Government control. By applying to the radium bureau a trusted officer would convey the radium to the operator and collect it again when the application was completed. Or a radium bureau could be established by wealthy philanthropists and could be conducted and controlled in much the same manner. The cost to provide radium for each individual metropolitan hospital and country hospital would be very great, whereas the one set of radium, I am sure, at a less cost could be made quite effective.

Now, gentlemen, do not you think that it is quite time that we made our voices heard and made them carry far and wide to the Government and to the general public, urging what are our great requirements? I think we have quite enough evidence to show that, at any rate in some cases, we can effect a cure and, if not in all cases, at any rate we are knocking at the door and with a little more investigation may at last open that door. I want you all to consider these remarks seriously and to see if the Government cannot be forced to help us.

AN HISTORICAL ACCOUNT OF THE OCCURRENCE AND CAUSATION OF LEAD POISONING AMONG QUEENSLAND CHILDREN.

DRAWN UP FOR AND ENDORSED BY THE COUNCIL OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

WE propose to give, firstly, a brief account of the symptoms of the affections which we attribute to lead poisoning among Queensland children and our reasons for this diagnosis and, secondly, to discuss briefly the source of the poison and our reasons for believing that this is fully ascertained and easily removable by legislation.

The first cases were recorded in 1892;[1] they were ten in number and occurred among children admitted into the Hospital for Sick Children, Brisbane, in 1891 and 1892. Reference is made to another case, not included in the report, which was admitted early in 1890. Naturally the cases which first attracted attention were those which showed peripheral paralyses with degenerative electrical reactions and wasting of muscles. In all ten cases three groups of muscles were affected:

(1) Extensors of the fingers in all cases, the extensors of the wrists in one only. Consequently, with the fingers extended there was wrist drop, but with the fingers clenched the wrist, except in that one case, could be extended. The *supinator longus* was never paresed (compare Gowers's "Diseases of Nervous System," 1888, article on lead poisoning, page 871).

(2) The small muscles of the hand were wasted and paresed, the *abductor opponens* and *flexor brevis pollicis* always, sometimes the adductor, hypothenar muscles and interossei. These muscles appeared to suffer from what Gowers terms the "primary atrophic" form of paralysis (*ibid.*, page 873).

(3) Paralysis, usually with wasting of the *tibialis anticus* and *extensor longus digitorum pedis,* was present in all cases. In one there was some affection of the peronei.

The paralyses were always of gradual onset and their duration varied from six weeks to several months before admission. In two cases there was a history over several years, the first attack having been recovered from and succeeded by a second after long intervals.

In nine cases the leg muscles were affected to a greater extent than those of the arm. This puzzled us, until we found that J. J. Putnam (in Keating's "Cyclopædia of Diseases of Children") had recorded this as characteristic of lead palsy in childhood.

The electrical reactions were tested in three cases. In all faradic irritability was lessened or abolished.

Sometimes galvanic irritability was slightly increased, the anodal closure disproportionately, so as to equal the kathodal closure, or the irritability to kathode was diminished, so as to be about equal to that of the anode, or again the kathodal irritability was diminished, so as to be distinctly less than the anodal, which was normal or less than normal.

These extensor paralyses below knee and elbow were considered attributable to peripheral neuritis. Such possible causes as beri-beri, alcoholism, arsenic poisoning were thought of, but no evidence could be found pointing that way. The symptoms associated with the paralyses were consistent with plumbism. They were anæmia more or less marked, pain in the affected limbs, colicky attacks and the presence of a blue line on the gums in some of the cases. In two cases the urine, after the administration of a few doses of iodide of potash, was analysed by two independent observers and found to contain small but distinct traces of lead.

The subject was reopened in 1897.[3] So far as the paralytic cases were concerned, former observations were confirmed. It was noted in accordance with American experience of plumbism in children, that in every case foot-drop appeared before and disappeared later than wrist-drop. Paralysis of the peronei had been occasionally observed, also spasm of the calf muscles and secondary *talipes equinus*. In two cases there had been paralysis of the diaphragm. It was found possible to recognize a prodromal stage of poisoning before paralysis appeared, characterized by attacks of colic, often with vomiting, relieved by pressure and usually accompanied by constipation, often also with pain and tenderness or severe cramps in the leg muscles. Sometimes a blue line would be observed in these early cases. Severe attacks of convulsions, sometimes fatal, had been observed in many of the paralytic cases. New ground was broken by the recognition of a group of cases with ocular symptoms. In 1892 four cases were described[2] as a definite clinical group characterized by symptoms of cerebral irritation—headache, vomiting—with intense optic neuritis and paralysis of external recti. Three cases recovered completely, the fourth was removed from observation. It was suggested that the cause might be a localized basic meningitis. In 1897 twenty-four cases were reported[4] in children between the ages of four and eight. These cases were remarkable for the excessive swelling of the optic disc and paralysis of one or both external recti in every instance. In two there was paralysis of all the external ocular muscles and in one of these ptosis. In the more severe cases the head was slightly retracted and the neck muscles stiff. All the patients recovered, but seven became blind; in two vision was impaired, in the remainder it appeared normal. Only one patient had had a previous attack of wrist-drop and foot-drop. Some of the patients had suffered from colic. In several a blue line was observed on the gums. In several lead was found in the urine. The conclusion arrived at was that these cases were due to plumbism affecting the brain and ocular nerves. In some cases of plumbism albuminuria was observed and in one fatal case there appeared to be actual nephritis.[5] Most of the cases observed were in Brisbane children; but cases had occurred in Charters Towers, Gympie and Southport.

In 1899 cases were recorded also from Maryborough, Ipswich and Toowoomba and two cases were exhibited which had originated in New South Wales.[6] In a paper published in this year[7] no important facts are added, but the "blue line" is discussed. This is rarely conspicuous in children. It consists, when observed by a lens, of confluent dots inside the gum opposite, perhaps, one or two teeth only. Its absence does not negative the diagnosis of plumbism. Rarely it may occur without symptoms, perhaps in a family in which others have characteristic symptoms. When necrosis and suppuration are present in or around the teeth there may be extensive blackish discolouration, not only in the gums, but also in the mucous membrane of the inner surface of the lips.

In 1904[8] in a paper dealing chiefly with the ætiology, an account of several fresh cases of ocular neuritis is given. The great swelling of the ocular discs is emphasized, the presence of ocular paralyses affecting always the external rectus, with but one exception, and the mildness of the constitutional symptoms in many of the cases. Of four cases in which the urine was analysed for lead, one gave 0.4 milligramme per litre, one 0.32 milligramme; in the other two no lead was detected.

In 1905[9] two hundred cases of plumbism in all had been recorded at the Brisbane Hospital for Sick Children, including fifty-four cases of ocular neuritis. In only two or three of these cases did paralysis of limb muscles occur at the same time as ocular symptoms, though in several others both groups of symptoms occurred in succession in the same patients. The resemblance of the ocular symptoms to those of cerebral tumour is pointed out and also to those of basal meningitis; but, unlike these conditions, ocular plumbism does not cause death.

The process used in the Government Laboratory for testing urine for lead is given. The possibility of traces of lead existing in the reagents used had been eliminated by careful controls.

In 1908[10] and 1909[11] the whole subject was again reviewed. Two hundred and sixty-two cases had occurred in the Brisbane Children's Hospital and some twenty children were being admitted every year, while every medical man practising among children in that town should see several cases annually. The symptomatology is given in detail, but little of it is new.

In 1911[12] the importance of lumbar puncture as a remedy in plumbic ocular neuritis was demonstrated. Increased tension of cerebro-spinal fluid is always present. Out of nine children so treated, all recovered good sight except one, who had seen badly two weeks before treatment was commenced. The condition most liable to be confused with plumbic ocular neuritis is gummatous meningitis.

In 1914[13] the Report of the Institute of Tropical Medicine gives an account of lead poisoning in children in Townsville. At first the cases were regarded with some scepticism, but this was completely removed by chemical analysis of the excreta.

Basophilic granulations in a small number of erythrocytes were found in the majority of cases, sometimes only after a prolonged search. A blue line was observed in a small percentage of the cases. The symptoms observed were malaise, vomiting, pains in the calf muscles, foot- and wrist-drop, paralysis and wasting of the small muscles of the hand, mental irritability and in one case dimness of vision. Severe convulsions occurred in some. Anæmia was only marked in cases of long standing. Both fæces and urine were examined for lead and a tabular statement of the quantities obtained in repeated examinations in sixteen cases is given. An attempt to find lead in the urine of healthy children living under the same conditions completely failed. It may be stated that for several years the basophilic reaction of the red cells has been used as a routine test of plumbism in the Brisbane Children's Hospital and has been found to be a valuable aid in diagnosis.

In 1917[14] the diagnosis of the ocular neuritis due to plumbism was again discussed, its difficulty, especially to one unaccustomed to these cases, being fully recognized and the importance of immediate treatment, especially by lumbar puncture, clearly set forth.

In 1919[15] the deionizing treatment recommended by Oliver was instituted at the Children's Hospital, Brisbane. In one case, in which active symptoms had disappeared, after deionization, the Government Analyst found just under 0.6 milligramme of lead on the negative electrode. Since then the same official has found lead under similar circumstances in another case. (Owing to the absence of controls, these analyses are not absolutely diagnostic as are the urine analyses.)

There is a strong impression among some Brisbane practitioners that the prevalence of chronic nephritis in young adults in this city is partly a late result of the absorption of lead during childhood. To prove this would be very difficult and in the absence of proof it can only be regarded as a probable opinion.

At our request we have received a report from the Brisbane Children's Hospital, showing that there are at the present time twelve children in the wards suffering from lead poisoning. One of these has ocular plumbism, the other eleven paralyses of limb muscles; of the latter, one has had papillœdema recently. Colic is noted in three children; leg pains in two. Ten children have foot-drop; three have wrist-drop. Ten of the children are said to be nail-biters; two are not. A blue line on the gums is present in four; in one it is doubtfully present. All have basophilia of the red cells. In four the red cell count is below 3,000,000. Urinary casts have been found in seven, albuminuria in two.

So far nothing has been said as to the source of the poison. We are anxious to establish the fact of lead poisoning among Queensland children, apart from any theory which may be held as to its causation. Certainly when considering any single case the fact, if known, that the child has been exposed to the ingestion of poison, may be a factor of some weight in determining our diagnosis and treatment. But even here in a well-marked case showing the symptoms and stigmata of plumbism, such knowledge is unnecessary for diagnosis, though of the utmost importance for prevention and cure. Still more strongly does this hold of a large number of cases occurring consistently without interruption in one locality over a period of thirty years. These cases show symptoms which are recognized all over the world as characteristic of plumbism. Indeed few, if any, of such symptoms have been absent. And if we have enlarged the known list of symptoms somewhat, this is not surprising, as no other locality has furnished such a number of cases in childhood spread over an equal period of years. The characteristic stigma on the gums has been present in a large number of these cases. Repeatedly the urine has been tested by our Government Analyst and by other skilled chemists and has been found to contain minute but indubitable traces of the metal time after time. We maintain that these facts should bring conviction to every competent and unprejudiced mind. Unanimity in our profession is rare and we cannot say whether it exists on this subject in Brisbane; but the diagnosis of plumbism, at first confined to a few, has spread until it has become the settled conviction of all medical men connected with the Children's Hospital, of all specially interested in children's diseases, of many excellent general practitioners and of at least the great majority of members of this Branch.

Needless to say, the source of the poison has exercised the minds of some of the profession here for the last thirty years. What we believe to be the true solution was slow in discovery; it was first suggested by one of our members, lately alas deceased, in course of a discussion in 1899,[7] but attracted little attention, as suspicion was then directed in another direction and, being unsupported by detailed evidence, it was forgotten until revived in 1904.[8] Received then with mingled acceptance and doubt it has stood the test of eighteen years' repeated investigation and use for prophylaxis and cure, for the cure of plumbism consists primarily in the prevention of the further ingestion of lead. Any hypothesis as to the source of the poison had to explain (*i.*) why cases arose every year among children, while no case (apart from those traceable to industrial occupation) was ever discovered in an adult, (*ii.*) why it occurred in Brisbane and other towns in Queensland from the extreme north to the extreme south, but not in rural areas, (*iii.*) why it should be comparatively common in Queensland, but rare or unknown as a malady of childhood in the southern States, (*iv.*) why, though often affecting several in a family, it often also picked out one child, the others remaining immune. It had also to be a *vera causa*, that is to say, the ingestion of lead in sufficient quantity over a sufficient period had to be proved. We claim that all these conditions have been fulfilled.

At the outset in 1892[1] suspicion was directed to the metal wrappings of sweetmeats and cigarettes, some of which were found on analysis to contain lead in large proportion. This hypothesis was found

to be inapplicable to so many cases that it was soon abandoned.

Of all sources of plumbism, apart from the industrial forms, perhaps the most important has been the contamination of drinking water. Now in Queensland towns much of the drinking water is collected from galvanized iron roofs which are fastened together by lead-capped nails. This water is stored in tanks, usually made of galvanized iron, the iron of some of the cheaper kinds being coated with an alloy containing lead instead of with pure zinc.[3] Tanks were sometimes repaired by solder containing lead and the connexions were sometimes made with lead piping. Suspicion of tank water was natural and was supported by the Government Analyst's report of the presence of lead in three samples of tank water. The hypothesis admirably explained the occurrence of plumbism in Queensland towns, but failed to explain why it did not affect adults. We were compelled to assume a greater susceptibility in childhood, but as year after year failed to bring forth a single adult case, this assumption became overstrained. It was also weakened by the failure of the Government Analyst to find lead in repeated samples of tank water submitted to him after the three positive analyses. Finally the hypothesis was destroyed by the Analyst informing us that water stored in galvanized iron tanks always contained zinc, that in the presence of dissolved zinc salts lead in solution is an impossibility, and that his previous positive results may have been due to impurity in the reagents used. We were grateful to him for his candour, our faith in the accuracy of his analyses (which are universally acknowledged) was, if anything, increased and we were left in doubt as to the ætiology of our cases.

In 1904[8] evidence was brought forward that the plumbism of children was caused by lead paint. It was pointed out that lead paint was dangerous (*i.*) when it was fresh and sticky, (*ii.*) when by exposure to sun and air the paint was loose and powdery and easily came off on the hands and was present in the form of dust. The first condition, stickiness, was of short duration and likely to be guarded against. The second, powderiness, was persistent until the surfaces were repainted and was especially common on verandah railings, fences and other outside surfaces exposed to sun and air. Two pieces of calico each a foot square were rubbed on some verandah railings. On analysis the first gave 0.3 gramme of lead, equivalent to 0.375 gramme of "white lead." Eighteen square inches from the centre of the other cloth were soaked in distilled water for twenty-four hours and practically the whole of the lead went into solution. No attempt was made to keep carbonic acid out of the distilled water, as it is present in all natural waters. In the case of one child suffering from ocular plumbism and passing 0.4 milligramme of lead per litre of urine, the child's brother showed a blue line on the gums. The parents had moved into a freshly painted house on December 5 and the child was brought to the Children's Hospital on January 7. The paint was still sticky. The mother said: "Those are the only two of my children who bite their nails." The evidence is not conclusive that the poison was derived from this house and not from powdery paint at their previous residence.

A visit was made to the house of a child suffering from ocular plumbism and passing 0.32 milligramme of lead per litre of urine. The child was two years of age and must have acquired the poison at home. The paint inside the house was in good condition, polished and not detachable on light friction. The verandah floors, as well as railings, were painted. Here the paint was dried and powdery. Pieces of calico cloth, 22.5 cm. × 10 cm., were used for rubbing the ceilings, walls of the living room, painted floor margin and verandah floors. The house had been cleaned and vacated and there was not much dust in the room. Samples of dust were carefully brushed off ledges into watch-glasses with a camel's hair brush to avoid dislodging the paint. From the cloth rubbed on the ceiling, where the paint was glossy and showed no signs of wear, no lead was obtained. From the cloths rubbed on the walls where the painted surface showed signs of wear 0.2 milligramme of lead carbonate was obtained. A similar quantity of lead carbonate was obtained from the cloth rubbed on the painted floor margin. From the cloth rubbed on the verandah floor twelve milligrammes of lead were obtained.

Dust.	Total Weight. Grammes.	Lead Carbonate Found. Milligrammes.
From top of moulding above door	0.2	1.5
Top of fanlight facing side verandah	0.25	Nil
Top of floor facing front verandah	0.25	0.2
Top piece of verandah blind	0.32	Nil
Top of skirting near door and side verandah	0.2	Nil

It was a hot day and it was found that the paint came off more noticeably on hands moist with sweat than on calico cloths. This child spent much of the day on the verandah floor and was fond of grasping the verandah rails.

Another house visited had white painted railings and a white painted gate from which the paint was readily detachable as powder. The paint had been rubbed off railings just at the height the children's hands would come in contact with it. One of the affected children in this household sucked her thumb. She had had repeated attacks of lead poisoning, occurring always in the summer months.

In summer children spend much time on the verandah and have hands moist and sweaty, so that the powdery paint adheres easily to them. On inquiry it was found that of eighty-five cases of lead poisoning in the Children's Hospital, forty-two had been admitted during the three hottest months, December to February, twenty-eight during the four months October, November, March, April and only sixteen during the five cooler months.

It was pointed out that powdery paint might be inhaled as dust and absorbed through the lungs, that possibly it might be absorbed through the skin, but it was thought that biting nails and sucking fingers was the chief method of absorption. The parents of ten children who suffered from lead poisoning, in answer to a question, replied in eight cases that these children bit their nails or sucked their fingers. Of five other children then under direct

observation in hospital, four bit their nails and one, aged two years, sucked his fingers.

In 1905[9] these facts were brought before the Intercolonial Medical Congress in Adelaide. The following motion was passed by the Section of Ophthalmology and reported to full Congress:

> That permanent blindness from lead poisoning among young children in Queensland has been recognized; that it is highly probable that paint used on verandah railings, etc., especially when exposed to weather influences, is the source of the poison and that this matter should be brought under the notice of the proper authorities.

Subsequently a confirmatory communication was received from the Queensland Commissioner of Health and published in the *Transactions*.

In 1908[11] special stress was laid on the danger of powdery paint on verandah railings and it was shown how the domestic architecture of Queensland towns favoured poisoning. The houses are almost always built of wood, raised on wooden piles and the verandahs railed in with painted railings. Young children pass their playing hours on these verandahs and clasp the railings with their moist, sweaty hands. In country districts, where the verandahs are low and unrailed or the railings unpainted, these cases of poisoning do not occur.

In 1917[14] experience had shown that recurrent attacks of lead poisoning could be prevented by warning the parents of the source of the poison and getting them to replace lead paint by zinc paint on verandah railings and outside surfaces within the reach of children. Among those who lived in rented houses and especially in the case of hospital patients, we could seldom get this done and patients cured in hospital frequently returned within a few months, often with a more severe attack. Here cure without prophylaxis was of no permanent value.

We had come to the conclusion that to prevent lead poisoning among Queensland children, legislation was necessary. Our effort in this direction culminated in a resolution familiar to readers, adopted at the Australasian Medical Congress held in Brisbane in 1920. A deputation from the Branch waited upon the Queensland Home Secretary in 1921 and from him obtained a promise that the forthcoming *Health Act* will contain a clause prohibiting the use of lead paint on verandah railings and outside surfaces within reach of children's fingers. That this proposed legislation should meet with determined opposition from powerful moneyed interests we fully expected. That that opposition should receive medical support, we certainly did not expect. In 1921 the subject of lead poisoning was introduced at an inquiry held by the New South Wales Board of Trade on the use of white lead in the painting industry. Evidence was given by Dr. S. A. Smith subversive of our conclusions. We propose to criticize Dr. Smith's evidence in a subsequent communication.

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Reports of Cases.

INTERMEDIATE PARALYSIS OF RESPIRATORY CENTRE.

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SOME twenty-eight years ago I saw several hospital patients with intermediate central respiratory paralysis in whom the outstanding clinical features were sudden failure of respiration, while the heart continued to beat regularly for considerable periods, if artificial respiration were maintained. One patient recovered sufficiently to be discharged from hospital and was lost sight of. One other recovered temporarily, but—I write from memory—died in a subsequent attack. The condition in both these patients was, I believe, discovered by Dr. W. F. Litchfield; certainly the first one was.

Another patient was the subject of an historic case of brain hydatid recorded by the late Sir James Graham. This man had been the first or one of the first to recover after operation therefor. He had been re-admitted some years after the operation for a recurrence of cerebral symptoms and died of intermediate central respiratory paralysis. The *post mortem* examination disclosed several hydatid cysts in the region of the original cyst; one of these had burst into the lateral ventricle. These cases and some others were afterwards published by Dr. A. S. Vallack in *The Lancet*.

Considering the extraordinary results of surgical interference in conditions of internal hydrocephalus recently reported from America, I venture to record another case of

intermediate central respiratory paralysis recently seen by me.

W.H.W., a married man, thirty-three years of age, was admitted to the Reception Ward, Kenmore Mental Hospital, on April 5, 1921. Apart from his mental symptoms, it was noted that he had a traumatic cataract in the left eye; the right pupil was dilated and without appreciable reaction to light or accommodation. Moreover, he complained of decreasing acuity of vision. I regret that no ophthalmoscopic examination was made. His pulse was slow, steady and full and his heart sounds normal. The urine was acid, contained phosphates, but no albumin nor sugar.

The morning after his admission, when sitting up in bed and about to be given his breakfast, but before any food had been taken, he suddenly stopped breathing. When seen he was unconscious, his face was blue and there was no corneal reflex. He was lying quite limp and making no attempt to breathe. As the heart was still beating, remembering the cases I have cited, I got his head over the edge of the bed and started artificial respiration. His colour soon became good and his circulation improved, so that the pulse at the wrist could be felt, regular and strong. Artificial respiration was maintained by relays of attendants for nearly twenty-four hours before his heart ceased to beat. During this time no spontaneous respiratory effort was made by the patient. Meantime, a lumbar puncture had obtained about 22 c.cm. of clear cerebro-spinal fluid, the first part coming with slightly increased pressure. This fluid contained a trace of albumin and gave a reaction for sugar. Later he was trephined by Dr. A. P. Gillespie about five centimetres above and one and a quarter centimetres in front of the right ear. The *dura mater* was very tense and the brain bulged through the small linear incision made through it. The right lateral ventricle was thereupon drained through a lumbar puncture needle and a considerable amount of clear fluid under increased pressure was removed till the brain ceased to bulge and its surface tension was palpably decreased. A silkworm gut wick was passed into the ventricle and the scalp wound closed. No anæsthesia was needed. No recovery of the respiratory function followed and death occurred next morning after about twenty-four hours of artificial respiration.

Post mortem examination disclosed a cyst situated in the white matter of the left cerebellar hemisphere and almost reaching to its upper surface posteriorly. The under surface of the cyst could be seen in the roof of the fourth ventricle. Before dissection it probably pressed slightly on the choroid plexus and the hinder part of the floor of the fourth ventricle. It displaced the *vermis* somewhat to the right. The *iter* was dilated to about the calibre of a lead pencil. Both lateral ventricles were dilated. There were no other cysts found.

On opening the cyst, it was found to contain clear fluid, like cerebro-spinal fluid, and to be without any definite detachable lining membrane, its walls being apparently the cerebellar substance itself with the pia arachnoid below. The contained fluid was unfortunately not saved for examination. Its amount may be estimated at about 30 cubic centimetres. The other organs of the body were healthy.

The only treatment likely to avail in such a case would be to open the skull at once and reduce the fluid pressure in the fourth ventricle, where, because of its comparatively superficial position in the floor, the respiratory centre has been subjected to continued increasing intermediate pressure. The resulting interference with blood supply and nutrition would, presumably, increase very slowly till some other sudden cause—in this instance possibly the act of sitting up in bed—would be sufficient to cause the extra anæmia necessary to produce that cessation of function so acutely instanced in cases of surgical shock.

A SUDDEN FATAL CASE OF MELÆNA NEONATORUM.

BY J. NOËL BROWN, M.B., B.S.,
Violet Town, Victoria.

THE interesting report of two cases of this unfortunate happening published in THE MEDICAL JOURNAL OF AUSTRALIA leads me to report a case personally experienced a few days ago, not to emphasize any particular therapy, but just to report a few unusual features.

Mrs. V., aged 33 years, in her seventh pregnancy, commenced her labour at 5 a.m. on November 29. I saw her at 8 a.m., near the end of the first stage. The *os uteri* was fully dilated, so I injected 0.5 c.cm. of pituitrin and the head was on the perineum in a quarter of an hour. The head was born fairly easily, but unfortunately the strong pains immediately ceased and there was no uterine effort at all to advance or to rotate the shoulders. The face and head quickly became cyanotic and, owing to it being a large fœtus, it took me several minutes manually to rotate and deliver the shoulders. The child was born deeply asphyxiated. However, with the usual methods it quickly came around; it became a healthy colour and cried vigorously. The child was born at 8.30 a.m.. It was put on one side and little notice taken of it, because the mother developed a worrying *post partum* hæmorrhage from the placental site. This was checked quickly and I left the house at 10 a.m.. At 10.15 I received an urgent message to say the baby was ill. On arrival I found the child dead.

The midwife told me that, shortly after my departure, the child grew quiet and became pale. On taking it up to wash it, it was deadly pale and limp and it died in her arms, after a sudden gush of what she called "diarrhœa." On looking at the napkin, I found a little meconium and the whole napkin saturated with dark, fluid blood. Clearly it was an intestinal hæmorrhage, sudden and large, that had rendered the child fatally anæmic.

I might say the child weighed 4.75 kilograms (10½ lb.) and looked particularly robust in every way.

Two features struck me as remarkable in this case: (*i.*) The quick advent of the trouble two hours after birth. (*ii.*) The large hæmorrhage, the initial and only one, ending fatally. This I think would have rendered any therapeutical measures hopeless. The text-books say singularly little about this condition and I would be glad of any information as to the exact pathology of the condition, as, unfortunately, I had no opportunity to perform a *post mortem* examination.

Reviews.

MEDICAL CONDUCT AND PRACTICE.

DR. W. G. AITCHISON ROBERTSON is lecturer on medical jurisprudence and public health in the Medical School of the Royal College of Surgeons, Edinburgh, and he states in the preface to his volume on "Medical Conduct and Practice"[1] that it has been his custom in his lectures on forensic medicine to include the subject of medical ethics His teaching on this subject is here embodied.

The contents include many matters which are imperfectly known to the young practitioner and which are not to be found in any text-book. They include such subjects as the principles which should guide one in starting practice, the elements of success in practice, the etiquette of the sick room, the giving of evidence in courts of law, the writing of certificates of various kinds, medical secrecy, examination of candidates for life insurance, etc..

On the whole, the standards laid down for the conduct of the medical man are on a high ethical level. Dr. Robertson properly lays much emphasis on the virtues of right conduct, devotion to duty, character, self-control, kindness, truthfulness and reverence as those which should guide the medical man in his practice. But on several points his opinion will not be generally agreed with. Thus he advises a young man before starting in practice to obtain a hospital appointment in a non-teaching institution, because there the young graduate can devote much more time to the clinical investigation of each case. "In hos-

[1] "Medical Conduct and Practice: A Guide to the Ethics of Medicine," by W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P.E., F.R.S.E., etc.; 1921. London: A. & C. Black, Limited; Crown 8vo., pp. 168. Price: 6s. net.

pitals where students receive instruction in clinical medicine and surgery a great deal of the resident's time is taken up in routine work preparing cases for lectures, etc., so that little time is left for his own personal edification."

Much emphasis is placed on the importance of study abroad. This advice is, of course, more readily followed in the United Kingdom than in Australia. It seems rather strange to hear the opinion that if foreign study is not available, much of the world may be seen as the surgeon of a ship, "where there is ample time for study and opportunity at each port to visit the local hospital and make onself conversant with the diseases of other countries."

One is interested and somewhat amused at the author's advice (given originally, we believe, by a distinguished English physician) that the doctor should gain his experience as an assistant in a locality other than that where he intends to settle. "Mistakes in diagnosis and treatment are bound to occur and it is well that such should not be known in the place where one is to take up one's permanent residence."

Dr. Robertson remarks that the appanage of the red lamp has now almost passed away. This may be so in Scotland, but certainly not in Australia, where the advantage of promptly locating the doctor's residence is held to outweigh the "advertising" disadvantage.

We can hardly agree with the author when he says that almost every physician now uses the binaural stethoscope, not so much that it is better than the old-fashioned monaural instrument, but because patients consider the doctor who uses the latter old-fashioned; and the young Australian doctor would feel inclined to dispute his dictum that, as most practitioners enjoy a fair amount of outdoor exercise, it is hardly necessary that they should employ leisure time in open-air pastimes.

That ethical standards differ in various parts of the Empire is shown by the statement that to take over attendance on a family, without receiving an adequate reason why they wish to terminate the services of the former practitioner, is from a medical point of view a grave breach of medical ethics and would receive general disapprobation. It is also stated that the new doctor should acquaint his predecessor with the fact that he had taken his patient over. Here, as in England, it seems sufficient for the new medical attendant to be satisfied that the services of the former attendant have been dispensed with. Again, it is stated that homœopaths and osteopaths may be consulted as long as they hold qualifications entitling them to have their names on the Medical Register. This is contrary to the Australian principles of medical ethics.

The advice in cases of syphilis to persuade the prospective patient to pay a sum in advance to cover the whole cost of drugs and professional services in connexion therewith is, we believe, not in accord with views generally held here.

In Australia it is usual to charge no fee to ministers of religion, unless they are (as rarely is the case) amongst the well-to-do. Dr. Robertson confines such gratuitous treatment to ministers (and their families) of the church which the doctor attends. In other cases a modified account is sent.

Very useful advice is offered on the subject of giving evidence in courts of law and writing certificates of lunacy, etc.. It must be remembered that legal conditions are not the same here as in Scotland and hence the advice loses some of its value.

In the final chapters the author deals in a sound and interesting manner with such subjects as the obligations of medical secrecy, the duty of the medical man in cases of criminal abortion, operations and the responsibility of the operator, malpraxis, contracts and book-keeping for the medical man. The volume thus presents many matters of much importance and value to the practitioner and if due allowance is made for the differences in view in some respects here and overseas, it may be read with profit by the majority of young medical men.

Naval and Military.

APPOINTMENTS.

THE following appointments, etc., have been notified in the *Commonwealth of Australia Gazette*, No. 8, of January 26, 1922:

Australian Military Forces.

FIRST MILITARY DISTRICT.

Reserve of Officers.

CAPTAIN A. P. MURPHY, M.C., is transferred from the Reserve of Officers, Second Military District, 1st January, 1922.

SECOND MILITARY DISTRICT.

Australian Army Medical Corps.

THE resignation of CAPTAIN P. A. C. DAVENPORT of his commission is accepted, 16th January, 1922.

THE provisional appointment of LIEUTENANT C. B. LEVICK is terminated under the provisions of Section 16 of the *Defence Act* and Australian Military Regulation 158 (*a*), 9th January, 1922.

Reserve of Officers.

CAPTAIN A. P. MURPHY, M.C., is transferred to the Reserve of Officers, First Military District, 1st January, 1922.

THE undermentioned officers are placed on the Retired List, with the ranks stated and with permission to wear the prescribed uniform, 1st January, 1922:

With the Honorary Rank of Colonel—LIEUTENANT-COLONEL R. G. ALCORN, V.D., and MAJOR (HONORARY LIEUTENANT-COLONEL) THE HONOURABLE J. B. NASH, V.D..

With the Rank of Lieutenant-Colonel—LIEUTENANT-COLONEL T. M. MARTIN, C.M.G..

With the Honorary Rank of Lieutenant-Colonel—MAJOR F. H. WRIGLEY, V.D., CAPTAIN (HONORARY MAJOR) H. STOKER, V.D..

With the Rank of Major—MAJOR C. A. EDWARDS, HONORARY MAJORS W. CHISHOLM, A. PENTLAND, A. S. BOWMAN and D. GWYNNE-HUGHES, CAPTAIN (HONORARY MAJOR) G. READ.

With the Honorary Rank of Major—CAPTAIN R. BEITH.

With the Rank of Captain and Honorary Major—CAPTAIN (HONORARY MAJOR) R. L. BROWN.

With the Rank of Captain—HONORARY CAPTAIN W. R. TOMLINSON.

THE undermentioned officers are retired under the provisions of Australian Military Regulation 152 (*i*), 1st January, 1922: HONORARY LIEUTENANT-COLONEL E. SINCLAIR. HONORARY MAJORS P. J. COLLINS, W. MCMURRAY, A. J. BRADY, G. E. RENNIE, F. A. POCKLEY, W. H. COUTIE, E. T. THRING, W. H. CRAGO and T. S. DIXSON; HONORARY CAPTAINS W. FISHER, R. BOWMAN, F. H. FURNIVAL, T. W. W. BURGESS, J. W. WATSON, R. MEAD, H. L. HARRIS, T. N. WRIGHT, C. H. SCOTT, H. G. BUTTON, J. W. GORMLEY, F. G. FAILES, J. HARRIS, E. H. FLORANCE, T. B. WALLEY, W. H. JOHNSTONE, T. D. BERTRAM, W. G. C. SMITH, A. A. COHEN, F. C. STEVENSON, R. W. YOUNG, P. D. BRAY, P. BLACKALL, H. E. BROWNE, D. THOMAS, G. B. M. JONES, C. ROSS, G. A. VAN SOMEREN, C. O. BIRCH and C. D. H. RYGATE; HONORARY LIEUTENANT H. WRIGHT.

THIRD MILITARY DISTRICT.

Reserve of Officers.

THE undermentioned officers are placed on the Retired List, with the ranks stated and with permission to wear the prescribed uniform:

With the Rank of Lieutenant-Colonel—HONORARY LIEUTENANT-COLONEL SIR J. W. BARRETT, K.B.E., C.B., C.M.G., 27th February, 1922.

With the Rank of Major—HONORARY MAJOR H. R. MACLEAN, 24th February, 1922.

With the Honorary Rank of Major—HONORARY MAJOR A W. F. NOYES, 8th January, 1922.

The Medical Journal of Australia

SATURDAY, FEBRUARY 11, 1922.

Pneumoconiosis.

On another page we publish a full summary of the more arresting facts elicited by the Technical Commission of Inquiry into the Prevalence of Miners' Phthisis and Pneumoconiosis in the Metalliferous Mines at Broken Hill. The Commission must be congratulated on a diligent and elaborate research and on a most important report. The evidence has been gathered with care and industry and represents a colossal amount of work. This report will gain recognition as one of the great contributions to the debated subject of the causation of pneumoconiosis and of that form of pulmonary tuberculosis which is grafted on to this condition.

Many years ago much confusion existed concerning the nature of the various forms of pneumoconiosis. The term "miner's phthisis" came into existence without any clear distinction concerning the antecedent conditions of the lungs after exposure to mineral dust. Legge and Collis first showed that anthracosis and siderosis do not tend to predispose the individual to infection with tubercle bacilli. Silicosis does so. It was thought that the determining factor in this distinction was the mechanical one. The coal dust and the extremely fine iron or steel particles produced relatively little irritation and gave rise to only minor degrees of pulmonary fibrosis. On the other hand, the sharp, hard, irregular particles of quartz wrought irreparable damage as a direct result of their physical qualities. More recent experimental work has tended to show that the pathogenesis of dust fibrosis of the lung is not entirely mechanical, but that the chemical element is an important one. There is reason to assume that siliceous dusts induce a pulmonary reaction partly in response to the slow absorption of silicates. This reaction may be of the nature of a biochemical response of the tissue fluids and cells to the passage of a foreign substance inimical to healthy pulmonary tissue. In addition, the physical irritation supports this process and intensifies the reaction.

Professor H. G. Chapman and Dr. S. A. Smith have demonstrated that a lode dust containing relatively little silica or quartz induces very little destructive change in the pulmonary tissue. The soluble constituents of the gangue probably lead to a slight but definite defect in the local defensive properties of the lungs. The inhalation of the Broken Hill lode dust, however, works very slowly and irregularly. Of close on four thousand mine workers, including 1,697 practical miners, only 193 exhibited signs of pulmonary fibrosis. Some of the men affected in this way had probably acquired the fibrosis in mines elsewhere as the result of the inhalation of dust rich in quartz particles. There were 853 practical miners who had worked only in the Broken Hill mines. Of these, sixty-three had become affected. These men had worked underground for varying periods up to over thirty years. In other words, 92.6% of the men who had worked exclusively in Broken Hill, escaped without damage. Moreover, it has been shown that of the men affected with pneumoconiosis, the majority manifested no clinical symptoms of their fibrosis. The diagnosis cannot be disputed, since Dr. Edwards has produced the most conclusive evidence in his wonderful skiagrams. Attention should be called to the extraordinary reproductions of these skiagrams, for which Messrs. Hartland & Hyde, of Sydney, are responsible. The details have been preserved to a surprising degree. The ultimate fate of these sixty-three men is, of course, in the lap of the gods. Up to the present, however, only twenty-four have become infected with tuberculosis. These facts are remarkable. The dust is highly complex. It contains from 7% to 44% of insoluble material, in addition to considerable quantities of lead, zinc, manganese and lime. The insoluble fraction is relatively light and consequently remains suspended in the air for longer periods than do the particles of the heavy metals. And yet so few men are damaged by it.

A very limited amount of evidence was collected of the pathological changes produced in the lungs of the miners. In those who revealed signs of pneumoconiosis, there was some peri-bronchial and peri-

vascular fibrosis and some interstitial fibrosis. Some of the damage may have been produced by the minute particles of lead and zinc which had accumulated in the tissues. The heavy metals induce degenerative changes in the capillaries and in the endothelium of the arterioles. This leads to a perivascular reaction and if the process be diffuse, there may be an appreciable amount of scarring. The dust recovered from the lungs of the miners contained lead, zinc and manganese, as well as silica. It was unquestionably the lode dust of the Broken Hill mines. It is not improbable that the lesions produced by the absorption of lead and zinc through the vessels of the lung may be in part responsible for the increased susceptibility to tuberculous infections and for the lowered resistance to these infections. It has been pointed out above that the physical hypothesis concerning the relation of pulmonary tuberculosis to dust affections of the lungs is not the whole story. The chemical basis of the increased vulnerability is an actual one.

The report is replete with instructive data. It should be studied carefully, not only for its information on a problem in industrial hygiene, but also for the collection of facts which may have considerable significance in various problems connected with pulmonary disease and toxicology.

THE MEDICAL PROBLEMS OF THE PACIFIC.

In the world of politics it has become almost traditional that the only interests that count are the interests of the people comprising the nation. The welfare of other nations is of importance only when this welfare is reflected in the safety of comfort of the people. In politics the first person plural is written with a very large capital letter. Even the health conditions of races subjected to the nation is a matter of small concern, provided that the nation itself is not endangered by a possible spread of disease from those under its control.

In the world of medicine all human life is sacred. The medical aspect of the "White Australia Policy" concerns itself merely with physiological facts. Medicine cannot recognize political expediency nor the demands of the worker to be rid of the embarrassing competition of cheap, coloured labour. The question of keeping Australia white, however, has no place in the length or breadth of our discussions, for the protection of native races against the devastating effects of endemic and epidemic diseases, often introduced by the white man, does not find any application. In the Pacific the humanitarian problem is very acute; it lies within the province of medicine to concern itself with this problem, not only on account of the danger that may be associated with a diseased and decaying race of natives, but also because it is the duty of the white man with all the advantages of the facilities at his disposal to exert himself to the utmost in endeavouring to save from extermination the races which have come unwillingly under his suzerainty.

In the Pacific to-day filariasis, anchylostomiasis, malaria, tuberculosis and many other diseases, but especially tuberculosis, threaten to lead to the extermination of many picturesque native races. Travellers of broad mind write freely of the simple charm of the various natives in the Pacific. Those who have taken the trouble to study their habits and customs and to adapt their behaviour in accordance with the conventionalities of the natives, realize that they have a right to live in safety. If the white man insists in disturbing the native, he must be prepared to guarantee that his contact does no material harm. Hitherto the white man cannot claim that his interference with the native has been harmless.

In the interests of the native population of the Pacific a well-organized medical service should be established. The form of medical service that Australia is providing in Papua and New Guinea is not good enough. The service must be properly organized from a convenient centre and every facility must be given to those entrusted with the work for carrying out extensive studies into the incidence of disease, into its pathology in the natives, into its prevention and into its alleviation. This form of research work is best conducted by enthusiasts who are willing to throw their whole energies, their entire lives into the tasks. Nevertheless, these workers should not be exploited. If left to their own resources, the majority of this type of research worker will defy Nature and will endeavour to crowd into the day in the tropics as much toil as the average

business man will put into a week in the cities in the temperate parts of the Commonwealth. The type is too rare to squander in this way. The research worker should be given ample assistance in his work and he should be prevented from devoting himself for long spells on end to it. In other words, he should have his headquarters at some centrally situated port in the countries bordering on the Pacific Ocean and he should be required to return from his tropical occupation at regular and relatively short intervals. Similarly, his assistants should be engaged on short terms and should not be transferred to the permanent staff until they have given evidence of the unquenchable thirst for knowledge that governs and moulds the life of the true investigator.

In towns where Europeans have their residence the medical officers of the medical service should be permitted to conduct medical practice in the ordinary way. In addition, the medical officers should be required to carry out those duties which are analogous to the duties of the health medical officers in mainland cities and States. They should receive adequate salaries for their services, which should include hospital work, attendance on natives when necessary, general investigational work, including field research, and the application of preventive measures. In purely native districts the right of private practice would be of no value. Nevertheless, the medical officers should be unhampered by restrictions of a kind likely to render them inclined to lose their initiative and freedom of action. The service should be under a uniform direction and all its integral parts should be coordinated, so that investigational work and the application of preventive measures may be energetically and skilfully carried out.

The islands of the Pacific belong politically to many nations. The ideal medical service would be one that is privately endowed and that has the support of all interested countries. Unfortunately a Mecænas is not found every day. An arrangement could be made between the governments of the countries concerned for the establishment of a Pacific Medical Service under the direct control of one country. There are many reasons why this service should not be organized by the Colonial Office of the British Government. On the other hand, there would seem to be little objection to the control being handed to the Federal Government under definite conditions and with contributions from the British Imperial Government and from the governments of all the countries who hold property in the Pacific. One of the strongest reasons for this arrangement would be the advisability of placing the *siège* of the service either in Sydney or in Brisbane. Direct transit from the centre to the several islands and tropical countries concerned is essential to success. The service would of necessity be a very large one and consequently headquarters should be at a place whence supplies could be expeditiously and conveniently forwarded. A large city is obviously more favourable than a small one for this purpose.

MENSTRUATION AND OVULATION.

THE physiology of the organs of generation in the female is so complex and is governed by so many half understood or possibly wholly unrevealed processes that the doctrines concerning ovulation and menstruation are constantly changing. Some of the facts have been known for centuries; others have been discovered in more or less modern times; not a few are very new comers. In the olden days the puzzle of the *corpus luteum* was attributed vaguely to a nervous influence, for it was noted that the rupture of the Graafian follicle and the development of the *corpus luteum* was dependent on the persistence of the ovum and its implantation into maternal tissue. Similarly, no adequate explanation was offered to account for the decidual reaction to the implanted ovum. A considerable amount of research has been carried out during the past decade on the reciprocal and antagonistic actions of the hormones of the several glands of internal secretion. Some of the hypotheses which have been presented, are without doubt somewhat daring and speculative. Others appear to have a foundation on observed physiological fact. Quite recently Professor Oskar Frankl, of Vienna, delivered before the Royal Society of Medicine in Ireland a singularly instructive lecture on the subject of menstruation and ovulation.[1] Before starting on his discussion of the mechanism which determines the relation between menstruation and the fate of the ovum, the author dealt critically with the evidence available concerning the relation between the organs of generation and the glands of internal secretion. He placed the hypophysis first. While the anterior part secretes a hormone of which little is known, the posterior lobe is responsible for the elaboration of a derivative of imidazole. Cushing and Aschner were the first to show the effect of this hormone in causing the development of the genital organs. During preg-

[1] *The Dublin Journal of Medical Science*, November, 1921.

nancy the hypophysis hypertrophies and its secretory cells become more active. After removal of the ovaries the hypophysis increases in size, but there is no glandular hyperplasia. The effect of pituitary extract on the uterine muscle is well known and confirms the findings that the hormone involved acts on the organs of generation. The pineal gland has been shown to be involved in the normal function of menstruation. The hormone of the pineal gland restrains the growth and development of the sexual glands and its functional decay provokes precocious sexual activity. There is much experimental evidence in support of this contention. The thyreoid gland has been shown to exert a stimulant action on chromaffin and indirectly on the sympathetic system. The ovary produces a hormone which protects chromaffin and reduces the irritability of the sympathetic. The thyreoid hormones increase blood pressure, while the ovarian hormones decrease it. Professor Frankl holds that it can be shown that in women during the climacteric the increase of adipose tissue is due to the pituitary, the flushings are caused by the action of the adrenal, while the sweating, the trembling and the increased heart beat are produced by the thyreoid glands.

It has been demonstrated by Meyer, Ruge and Schröder that the Graafian follicle ruptures between the fourteenth and the sixteenth day after the termination of menstruation. The ovarian cycle starts with the development of the follicle. The follicle matures and ruptures. As long as the ovum is alive the *corpus luteum* developes. The stages of proliferation and vascularization are followed by the stages of maturity and of involution. Since involution takes place only when the ovum dies, it is assumed that an important part is played by the ovum itself in stimulating the ovary. In other words, the ovarian hormone is derived to a considerable extent from the ovum.

Immediately after menstruation the uterine mucosa is reduced to a layer of approximately one-half to one millimetre. In the intermenstrual period the mucosa becomes thickened and vascular. Toward the end of the period, shortly before the next menstruation the mucosa may measure from ten to fifteen millimetres in thickness. It becomes extremely vascular and assumes an œdematous appearance. It is supposed that this is the only instance of a physiological œdema. It has further been shown that after the rupture of the follicle and the subsequent development of the *corpus luteum* the uterine mucosa prepares itself for the reception of the ovum. This is determined by hormonic action. If impregnation does not take place, the ovum dies. It is then no longer capable of exerting an influence on the *corpus luteum*. The latter undergoes fatty changes and the process of fibrosis follows soon after. As soon as the *corpus luteum* is undergoing degenerative processes, menstruation begins. With the disappearance of the active *corpus luteum* another Graafian follicle is developed, but not before. This new follicle then ripens and the cycles in the ovary and in the uterus are repeated.

Professor Frankl calls to his aid some direct experimental evidence to explain the apparent paradox of the production of hyperæmia by the action of the ovarian hormones and the occurrence of bleeding from the uterine mucous membrane as soon as the *corpus luteum* and the ovum, the two sources of ovarian hormone, die. The glands in the middle portion of the mucous membrane secrete mucus which has been shown to contain a tryptic ferment. As long as the ovarian hormone is active, the hyperæmia produced keeps the efferent ducts of the glands more or less closed. When the *corpus luteum* dies, the hyperæmia suddenly subsides and the ducts, becoming patent, permit the mucus to escape. The trypsin acts on the surface layers of the mucosa and a casting off of these layers is effected. It is the presence of the tryptic ferment that prevents the coagulation of the menstrual blood. He emphasizes the physiological fact that the whole process is perfectly performed only when the normal balance is maintained by the several hormones concerned. It is not difficult to devise therapeutic measures which might remove, temporarily at least, some failure of function of the various ductless glands in their relation to menstruation.

LIPODYSTROPHIA PROGRESSIVA.

THE disease which claims the ungainly and rather inapt title of *lipodystrophia progressiva* owes its earliest recognition to the late Sir William Osler. That astute master of clinical observation noticed the characteristic features of the malady in a girl of ten years as far back as the year 1895. These features are briefly a symmetrical, slowly progressive and almost complete disappearance of the subcutaneous fat of the head, face, neck and upper extremities and of the trunk as far down as the folds of the groin in front and the upper limit of the pelvis behind; an excessive accumulation of subcutaneous fat in the buttocks and lower extremities; and a favourable outlook as regards general health and length of life. Sir William Osler's case was not reported till 1917, but it had been ascertained in 1913 that the patient's emaciation had ceased, that she had enjoyed good health and that she was actually more physically fit than the average member of her sex. Meanwhile, Arthur Simons, of Berlin, published a full description in 1911 of the disease under the caption: "An Unusual Tropho-neurosis—*Lipodystrophia Progressiva*." Gerhartz attempted five years later to improve on this name by the use of the description *lipodystrophia progressiva superior*. About twenty-seven well-defined cases of the disease have been published, the diagnosis of which is beyond dispute. Of the patients concerned, twenty-five were females and two males. In twelve other instances of less definite and extensive involvement all the patients were men.

The appearance of a patient suffering from the disease in a well-marked form is characteristic. The eyes are, so to speak, set well back in their sockets. The malar arches stand out in prominent relief between the sunken temporal fossæ and the hollow cheeks. Deep wrinkles appear on the thin, wasted face when the patient smiles. The neck is thin and "sinewy." The clavicles, scapulæ and vertebræ stand out prominently and the intercostal spaces are

plainly seen. The general appearance is one of excessive muscular development and extreme loss of subcutaneous fat. The thin, flat abdomen makes an incongruous contrast with the fat buttocks, thighs and legs. Harry Campbell exhibited a typical example of the condition before the Clinical Society of London in 1907 and described the disease as "a disappearance, more or less complete, of the subcutaneous fat above the region of the lower extremities." Pic and Gardère described a case two years later as *"un cas d'atrophie généralisée de la face et de la région sus-ombilicale du corps avec pseudo-hypertrophie de la région pelvienne et des membres inférieurs."* The diagnosis of pulmonary tuberculosis is commonly made, in view of the apparently marked cachexia of the patient. The patient is not, as a rule, without qualms, since he views the gradual emaciation of his face and chest as suspicious evidence of pulmonary tuberculosis. There is no pathological involvement of the muscular and osseous systems and to electric stimulation the responses of muscle and nerve are normal.

Dr. Henry Lee Smith, of the Johns Hopkins Hospital, Baltimore, has called attention to this rare and interesting condition by reporting a detailed study of a case of the disease.[1] The patient was a woman, thirty years of age, who complained that her cheeks were sunken and that her neck, body and arms were thin. It was a matter of deep concern to her that her friends and neighbours considered her tuberculous or cancerous and she had actually been treated by medical men for "fibroid pulmonary tuberculosis." Yet she had always enjoyed good health and was engaged in arduous household work. The wasting had commenced in her face at the age of fourteen years, up to which time she had been a rosy, round-cheeked girl. The wasting became progressive and involved her arms and body, but stopped abruptly at the pelvic bones and groin folds. Within three months from the time of onset her face had attained its present degree of emaciation and her buttocks, thighs and legs had become fatter and rounder. The author excised a piece of skin from the left upper forearm and examined it histologically. It appeared normal in structure, except that there was an almost complete absence of fat in the tissue beneath the corium. These findings agree with those of Simons, Christiansen and Freer. They merely confirm and do not elaborate the results of clinical examination.

Dr. Smith discusses the theories advanced to explain the cause of the disease. Spear believes the condition to be related to the muscular dystrophies. Simons, Freer and the majority of observers believe that it is due to a disturbance of the endocrine system. Freer attributes it to a disordered function of the thyreoid gland. The obesity of myxœdema and the cachexia of certain forms of hyperthyreoidism are quoted as examples of the influence of the thyreoid secretion on the *panniculus adiposus*. Many of the observers have noted in their patients evidence of derangement of the thyreoid gland. In Dr. Smith's case the patient had a moderate enlargement of the thyreoid gland, some prominence of the eyes, slight lagging of the upper lid (von Graefe's sign), tremor of the fingers, moderate tachycardia and an increase in the metabolic rate. Boissonnas has attacked the "glandular theory" and asks how a glandular lesion can simultaneously cause loss of fat in one part of the body and excessive deposit in another. Like all obscure affections this disease does not lack protagonists of many theories and it would be strange if in these days of "clinical endocrinologists" one or all of the ductless glands were not blamed for the disease. Time and patient observation will help Medicine on her difficult and arduous way. She has yet a long way to travel.

[1] *The Johns Hopkins Hospital Bulletin*, November, 1921.

SUGAR CONTENT OF BLOOD OF ATROPHIC INFANTS.

THE problem of the waste of life during the first three months, while fraught with difficulties, remains unsatisfactory, largely on account of the extraordinary confusion of the factors which contribute to early infantile death. The terms marasmus, atrophic infants, debility and wasting merely connote a symptom, a very apparent symptom it is true, but not a pathological process. It is claimed that starvation or partial starvation is an essential in marasmus. Surely this is a platitude, since the only constant symptom of marasmus is wasting. Fleming has gone a step further and has endeavoured to show that the carbo-hydrate tolerance of these infants is not altered and that considerable quantities of sugar can be given to atrophic infants without increasing glycuresis. Dr. R. A. Guy now records the results of a series of carefully planned and well executed experiments to determine the sugar content of the blood of these infants.[1] In the first place, it would appear that the sugar content of the blood of healthy infants three hours after food varies between 0.06% and 0.11%. Some observers have found that there is a lowering of the content in "atrophy decomposition" (whatever that may be). Dr. Guy carried out his investigations with the aid of Meyers and Bailey's modification of the Lewis-Benedict method. He endeavoured to standardize the sugar content in forty-three normal infants. The range proved to be from 0.06% to 0.09%. He pointed out that there are two essential differences between the sugar metabolism of infants and that of adults. In the first place, in infants the sugar is to a large extent used not for work and repair but for growth. In the second place, since the feedings are given at short intervals, the absorption is almost continuous. He found that in so-called marasmic infants who are vomiting, there is a low blood sugar content. In the infants who are not vomiting, the decrease is slight. Moreover, there does not appear to be any relationship between the amount of sugar ingested and the percentage of the sugar in the blood. While he is inclined to assume a defective storage of sugar in the liver, dependent on a defective absorption, he admits that there is no definite proof of defective absorption to be ascertained from the analysis of the peripheral blood.

[1] *The Quarterly Journal of Medicine*, October, 1921.

Abstracts from Current Medical Literature.

PATHOLOGY.

Absorption from the Peritoneal Cavity.

CHARLES BOLTON (*Journal of Pathology and Bacteriology*, October, 1921) has investigated the absorption of fluids and particles from the peritoneal cavity. He found that in cats affected with ascites the peritoneal cavity is drained principally by the diaphragmatic lymphatics into the mediastinal lymphatics passing through the sternal and anterior mediastinal lymphatic glands to the right lymphatic duct and also through anastomoses in the chest to the thoracic duct. It is drained also by the diaphragmatic lymphatics into the *cisterna chyli*, but this latter path is quite subsidiary to the former. It is probably also drained to a small extent very slowly by the retro-peritoneal lymphatics into the *cisterna chyli*. Particles pass easily between the endothelial cells with the lymph, the limit of size of such particles being approximately that of the red blood corpuscles of the animal used. The drainage is accomplished by a purely mechanical process, the force being supplied by the respiratory movements. Colloidal dyes, which are indiffusible outside the body, pass through the peritoneum and capillary wall by diffusion directly into the blood, but more slowly than crystalloids. If colloids of a larger molecular weight are able to pass through, they must do so very slowly and in small quantity, but it is probable that molecules of the complexity of those of albumins are unable to do so. Poisonous or other substances, whether formed by bacteria or otherwise, which are indiffusible through an artificial membrane, may still be directly absorbed into the blood from the peritoneum, provided that they are not of great molecular complexity, otherwise they will be slowly absorbed by the lymphatics.

Cicatrization of Wounds.

ALEXIS CARREL (*Journal of Experimental Medicine*, November 1, 1921), in experiments on dogs at the Rockefeller Institute, found that in wounds protected by a connective tissue dressing against mechanical, chemical and bacterial irritations, no evidence of cicatrization was found. The complete or partial failure of four experiments was due to the slipping of the inner dressing from the wound, mechanical irritation by the gauze and infection. In the two experiments in which the connective tissue was maintained at the surface of the wound, there was no beginning of cicatrization, although twenty-five and eighteen days respectively had elapsed since the operation, while in the control wound the duration of the latent period did not exceed five or six days. While it is not known whether cicatrization could be prevented for an indefinite period, there is no doubt that the mechanism of regeneration is not set in motion at the usual time, when all external irritations are suppressed. It appears, therefore, that under ordinary conditions cicatrization is not initiated by an internal factor. On the contrary, the application of turpentine, chick embryo pulp and staphylococci decreased markedly the length of the latent period, which was often reduced to less than two days. This fact demonstrated the importance of external factors in the initiation of cicatrization. It seems that the mechanism of regeneration has become adapted to the ordinary conditions of life of the animals. A small wound will begin to cicatrize sooner if slightly infected, as practically always happens, than if it were thoroughly protected by a non-irritant dressing.

Digestion of the Œsophagus.

J. H. PRINGLE, L. T. STEWART AND J. H. TEACHER (*Journal of Pathology and Bacteriology*, October, 1921) have investigated sixteen fatal cases of digestion of the œsophagus. They point out that post-operative vomiting of black material or hæmatemesis is a symptom of great importance to the practical surgeon. In some cases, the cause of this condition appears to be digestion of the œsophagus. Vomiting of black material or blood in the course of non-surgical disease may also be attributable to the same cause. Such cases are all of severe infective or toxic nature. In the authors' series of cases the characteristic vomiting was observed most commonly from thirty-six to twenty-four hours before death. The condition of the œsophagus may vary in different cases from superficial erosion of the mucous membrane to deep ulceration and perforation or extensive destruction of the tube and digestion of the adjacent structures. In contrast with the state of the œsophagus there is little or no digestion of the stomach and the cardiac orifice is found closed. The authors conclude that digestion of the œsophagus may occur during life and as a result blood or black fluid may be vomited. This is not an agonal condition, but one the nature of which can be diagnosed during life and which might be amenable to treatment. It is not extremely rare. In all probability these cases of digestion during life have commonly been regarded as merely *post mortem* digestion and their significance in relation to hæmatemesis has been overlooked.

Bacterial Flora of the Upper Air Passages in Common Colds.

ARTHUR BLOOMFIELD (*Johns Hopkins Hospital Bulletin*, April, 1921) records the results of his investigations on the variations in the bacterial flora of the upper air passages during the course of common colds. On clinical grounds the view was advanced that the common cold is an infectious disease analogous to influenza, featured by the frequent development of complications in the upper air passages, such as sinus infections, tracheitis and otitis. A review of the literature showed no convincing evidence that any known organism is the primary cause of the cold. The cultural studies in the author's report fail to show in uncomplicated cases any variation in the flora which would enable one to select any organism or group of organisms as the cause of colds. On the other hand, where clinical complications occurred, pathogenic organisms were definitely associated with them. The author considers that the primary cause of colds is probably an organism as yet unknown and certainly not one of the usual pathogenic germs, such as the streptococcus, the pneumococcus, the *Bacillus influenzæ* or the staphylococcus. But the primary cold, whatever its cause, alters the mucous membranes in such a way as to allow secondary bacterial invasion and consequent frequent development of local complications. The cultures clearly indicate that such complications are due to a variety of bacteria, such as the pneumococcus, streptococcus and staphylococcus.

The Wassermann and Sachs-Georgi Reactions.

RIGNEY D'AUNOY (*Journal of Medical Research*, June-September, 1921) has made a comparative study of those two aids in the diagnosis of lues known as the Wassermann and Sachs-Georgi reactions. After reviewing the literature on the subject, he gives the results of his experiments performed on a series of 2,150 sera. He considers that physico-chemical changes in the globulins of luetic sera, evidenced by precipitation or flocculation when they are brought in contact with certain colloids, probably account for the so-called "reaction of complement fixation." In a comparative study of the flocculation reaction of Sachs and Georgi and the original Wassermann reaction the author obtained identical results in 98.07% of tests. All sera in the series which manifested spontaneous flocculation when the Sachs-Georgi technique was used, gave so-called "anti-complementary results" when the original Wassermann method was utilized. Febrile states apparently do not give rise to false positive results. The author considers that, owing to its simplicity and apparent reliability, the precipitation test proposed by Sachs and Georgi for the serum diagnosis of syphilis is a valuable addition to laboratory methods.

Relation of Hodgkin's Disease to Sarcoma.

THEODOR MUELLER (*Journal of Medical Research*, June-September, 1921) reports two cases of Hodgkin's disease which show a change in the histological structure from typical lympho-granuloma to round-cell sarcoma or *vice versa*. In one of the cases the disease exhibited neoplastic properties, with invasion of lungs, aortic wall and spinal canal. From a histological and anatomical point of view the author thinks that lympho-granuloma and round-cell sarcoma of the lymphatic glands are only different expressions of the same process. The cause for the sar-

comatous infiltrating source of the disease is to be sought in the individuality of the patient, in the amount and virulence of the causative agent and the duration of its action on the lymphatic tissue.

PÆDIATRICS.

Cœliac Infantilism.

REGINALD MILLER (*Lancet*, April 9, 1921) has recorded a fatal case of cœliac disease with the findings at autopsy. Reviewing the literature in regard to this rare clinical entity, the author discusses the pathological findings in the few cases in which *post mortem* records of this disease have been reported. The author's case was that of a boy, aged 5½ years, who died from influenza after suffering from cœliac symptoms for a period of five years. No chronic changes to account for the protracted symptoms were found in the liver, pancreas, intestine or other organ. This case seemed to show that cœliac disease, persistent enough to produce infantilism and severe enough to be associated with attacks of œdema of the "alimentary" type, might exist apart from structural changes in the liver, pancreas or intestine. The persistence of excessive fat wastage was independent of morbid changes in these organs. Among the symptoms of cœliac disease, the excessive fat loss in the stools stands out as the feature of pre-eminent importance. Attention is therefore directed to the possibilities that organic disease of the pancreas or liver may interfere with fat digestion and disease of the intestine with fat absorption. In the well-known work of Hertu on intestinal infantilism, published in 1908, the thesis was advanced that failure of fat absorption was the result of the presence of a chronic inflammation of the bowel. This was ascribed to the overgrowth and persistence of certain flora of the infantile intestine. Numerous subsequent writers have reported cases in which deficient fat absorption has been described as correlated to changes in the intestine. From a careful study of detailed pathological findings in fatal cases of definite cœliac disease the author has concluded that sufficient evidence has not been adduced to justify the assumption that an enteritis is essentially the pathological basis. It is maintained that cœliac disease is independent of organic changes in the bowel and is due to a digestive fault, probably a defective action of the bile on fat absorption.

Empyema in Children.

W. E. LADD AND G. D. CUTLER (*American Journal of Diseases of Children*, June, 1921) made an analysis of 172 cases of empyema in children, in an endeavour to ascertain what merits the "closed method" of drainage had and to what class of children it was applicable. This investigation was carried out as a result of the very high mortality attendant on rib resection in cases of streptococcus empyema in army camps. They found that the diagnosis of empyema in children is frequently not made until late and that this factor has its influence on the type of operation to be selected. A preliminary thoracocentesis should be done to ascertain the type of infection. In streptococcus infections it is probable that aspiration or closed drainage through a tube would supply sufficient drainage and result in lower mortality. These infections have a tendency to abort, recovery taking place without operation, so that moderately good drainage will effect a cure, while it would fail in other types of cases. In pneumococcus empyema closed drainage is useful as a temporary measure in the case of extremely sick patients, but it is not to be recommended as the operation of choice. It does not supply adequate drainage and it does not allow the operator to free the lung, a manœuvre which can be performed on a child through a small opening with one finger. The cause of so-called collapsed lung is not the atmospheric pressure exerted through an open wound, but the result of inadequate operation and drainage. In the few patients in whom it is unwise to free the lung at the first operation and in whom the lung remains bound down by adhesions, a decortication is required. This is usually sufficient to obliterate the cavity and cause healing. Operations causing collapse of the chest wall are contra-indicated, because they cause distressing deformities and are unnecessary. Closed drainage and suction should be used in certain well-defined cases.

Immunity to Diphtheria.

W. H. PARK (*American Journal of Diseases of Children*, July, 1921) emphasizes the necessity for a standardized toxin in the investigation of immunity to diphtheria and for a rigid inoculation technique. He also discusses sixteen cases of suspected diphtheria in children who had previously failed to give a Schick reaction. Of these sixteen cases, eight, which occurred in a single institution, were personally investigated by the author. He concludes that a "negative" Schick test in children who have an active immunity, either natural or acquired, when the toxin used and the technique employed have been suitable, means an almost complete security from diphtheritic disease, not only for the immediate time, but for the future. Those who have natural antitoxin and those who acquire it through antitoxin injections, may harbour diphtheria bacilli. If they later suffer from tonsillitis due to other microbes, cultures from their throats will contain diphtheria bacilli. The "positive" culture suggests but does not establish that the suspected case is one of diphtheria. Under unusual conditions it is possible that when diphtheria bacilli are present in a throat which becomes the seat of some other infection, they may develope their toxin and cause superficial lesions in the mucous membrane, even though there is sufficient antitoxin to give a "negative" Schick reaction. Cases which present this possibility are rare. In the author's cases of this type, the patients have done well without additional injection of antitoxin. In the outbreak investigated, the fact that while an extraordinarily large percentage of all the children in the institution were carriers of virulent bacilli only one group developed signs of tonsillitis with pseudo-membranous patches, makes it uncertain that the illness was diphtheria.

The Cerebro-Spinal Fluid in Congenital Syphilis.

L. B. KINGERY (*Journal of the American Medical Association*, January 1, 1921) examined the cerebro-spinal fluid of fifty-two children suffering from congenital syphilis. Of the fifty-two children, the cerebro-spinal fluid in fifteen (28.8%) showed some abnormality. These fifteen children could be divided into two groups. The first group consisted of four children in whom the clinical manifestations of the disease were slight but definite. The cerebro-spinal fluid of these four children gave a definite, but not marked Wassermann reaction. The cell count showed a slight pleocytosis. The highest cell count was fifteen in a microscopical field. The early impairment of the central nervous system was shown by the presence of chorio-retinitis, increased reflexes and severe nerve deafness. The second group consisted of eleven children with more severe grades of involvement. In each instance the spinal fluid yielded a definite Wassermann reaction. A marked parallelism existed between the degree of the Wassermann reaction and the increase of globulin and albumin. No parallelism existed between the degree of pleocytosis and the other findings. The cell count varied from 6 to 159.

Influence of Sugars and Candies on Gastric Secretion.

R. J. MILLER, O. BERGEIM, M. E. REBFUSS AND P. B. HAWK (*American Journal of Physiology*, August, 1920) found that small amounts of cane sugar or glucose did not appreciably inhibit either gastric secretion or evacuation. Large amounts of cane sugar or glucose in concentrated solution markedly depressed secretion and delayed the emptying of the stomach. Candies acted in proportion to their sugar content and the amounts of them ingested. This tendency was influenced by flavouring substances and added food ingredients, *e.g.*, milk, egg, chocolate, etc., which stimulate gastric secretion. Candies should not be eaten before but after meals. For children hard candies, which must be sucked, are preferable to cream candies, because of the smaller quantity of less concentrated sugar solution derived from them. Peppermint oil used as a flavouring agent delayed the emptying of the stomach. Chewing caramels gave rise to more gastric secretion, but delayed evacuation. Liquorice gave rise to fairly abundant secretion.

Special Abstract.

PNEUMOCONIOSIS IN MINERS AT BROKEN HILL.

THE REPORT OF THE TECHNICAL COMMISSION OF INQUIRY INTO THE PREVALENCE OF MINERS' PHTHISIS AND PNEUMOCONIOSIS IN THE METALLIFEROUS MINES AT BROKEN HILL is a valuable document covering seventy-four foolscap pages of letterpress asnd including some remarkable skiagrams and other illustrations at the end of the book. It will be remembered that the Technical Commission of Inquiry isssed an interim report on July 12, 1920 (see THE MEDICAL JOURNAL OF AUSTRALIA, July 24, 1920, pages 87 to 89). This interim report contained some of the data, now amplified and completed, as well as a number of recommendations.

The first chapter contains an account of the circumstances in which Professor H. G. Chapman was commissioned to undertake the investigations. It includes the story of the appointment of his colleagues on the Commission, Dr. S. A. Smith, Dr. W. A. Edwards, Dr. W. A. Sawyer and Dr. H. S. H Wardlaw and of the other members of the staff. The methods adopted in instituting and conducting the inquiry are also set out in detail.

The second chapter bears the caption, "Conclusions." The Commission examined 3,967 miners and carried out partial examinations in 370 additional mine workers. The examinations included a complete clinical (physical) investigation, as well as skiagraphic, chemical, bacteriological and other examinations. Of the total number of mine workers, 193 were found to be affected with pneumoconiosis and 39 with pulmonary tuberculosis without signs of pneumoconiosis. The pneumoconiosis was in the first stage in 90 persons, in the second stage in 44 and was complicated with pulmonary tuberculosis in 59. It is further pointed out that only 70 of the 193 mine workers affected with pneumoconiosis had worked exclusively in the mines at Broken Hill; the remainder had also worked in other mines. In order to avoid repetition and to conserve space the information on which the various conclusions are founded, will be summarized as each special subject is discussed. This information is to be found in subsequent chapters in the report.

The Diagnosis of Pneumoconiosis.

The medical examination was conducted in a stereotyped manner in order that the results might be uniform. Full details were entered on cards. Particular attention was paid to the history, to the worker's complaints, if any, and to the results of the general examination. While the physicians undertaking this work were fully informed concerning the findings in other countries, they realized the necessity of weighing the significance of each sign and symptom in arriving at a diagnosis of pneumoconiosis. They discovered that forty men out of the ninety with uncomplicated pneumoconiosis in the first stage and fifteen out of the forty-four men with the condition in the second stage manifested no symptoms of ill-health. Dyspnœa was present in forty-three men of the first and twenty-seven men of the second group. The dyspnœa was slight in many instances and was often intermittent. In not more than twenty-eight of the seventy men with dyspnœa was it of clinical significance. Moreover, it was found that shortness of breath was present in 19% of a group of 500 miners not suffering from pneumoconiosis. In 9% of the 500 men the dyspnœa was traced to some obvious cause, such as asthma, emphysema or cardiac disease. Cough with or without sputum was noted in about half the men with fibrosis of the lung and in 24.6% of the 500 unaffected men.

Of the first stage men thirty-seven had worked only at Broken Hill and fifty-three had worked at other mines as well. Shortness of breath was noted in fourteen of those who had worked exclusively in Broken Hill mines and in twenty-seven of those who had worked at least two years in mines other than at Broken Hill. Similarly, cough with sputum was more common among the men who had worked elsewhere than among those whose mining life had been limited to Broken Hill. Some measure of the dyspnœa was obtained by the test of running a distance of 0.23 kilometres (250 yards) within eighty seconds. Of the ninety men, twelve were not required to perform the test on account of independent physical disabilities. Ten men were obviously dyspnœic after the run. This represents only 13% of those tested. Only one man was in distress, but he was found to have a dilated heart. Of the ten men, two had worked at Broken Hill only and eight had worked in other mines as well. It was noted that there was a greater rise in the pulse rate in those affected than in men not affected. No distinction was elicited between those of the Broken Hill only group and those of the other group. The respiratory rate was not increased to a greater extent than in men unaffected by fibrosis of the lung. The chest expansion was not materially altered, neither was there any definite diminution of the total vital capacity in the affected men. The physical signs of fibrosis includes weak, distant breathing and at times signs of an old pleurisy. These signs were present in less than 22% of the men, while other physical signs were detected in 42%. There were no physical signs at all pointing to pneumoconiosis in 36%. The diagnosis in these cases was based on the radiographic findings.

Dr. W. A. Edwards has given a series of skiagrams of the normal chest and of the chest affected with the various stages of pneumoconiosis uncomplicated and complicated with pulmonary tuberculosis. The skiagrams are extraordinarily clear and are works of art. The reproduction by Messrs. Hartland & Hyde commands our admiration. Dr. Edwards shows clearly that the first stage of pneumoconiosis can be diagnosed with certainty when there is an increase of the hilum shadow and an increase of linear markings. A comparison of skiagrams of the lungs of normal people with those of persons in the second stage of pneumoconiosis and with those with tuberculosis demonstrates the characteristic appearances. When the first stage co-exists with peri-bronchial tuberculosis, difficulties arise. It was found that the lungs of miners who had worked only at Broken Hill, were more sharply stippled than those who had worked elsewhere as well. Opportunity presented itself on a few occasions to examine the lungs *post mortem*. It was then seen that the amount of fibrosis in the lung of the Broken Hill only men was less than in the lungs of men who had worked in mines where the dust is rich in quartz particles.

The physiological reaction, physical signs and general characters of fibrosis in the second stage were similar to those of the first stage. Cough with sputum was somewhat more common; cough without sputum was equally frequent in both stages. Dyspnœa as measured by the running test was more frequent and more marked. Six of the forty-four men were not tested for independent reasons or could not complete the test. Of the remainder, six men showed distress. This represents 4% more than in the first stage group. The distress was moderate in three men and severe in three others. The pulse rate was increased to a greater extent than in the first stage group. A slight difference was noted in the chest expansion, but none in the total vital capacity. The complete clinical picture of fibrosis was seen in only 20.5% of the men of the second group, while in 44% there were no physical signs other than those revealed in the skiagrams.

It is stated in the report that pneumoconiosis causes symptoms in comparatively few men in Broken Hill and produces a typical picture in even fewer. The diagnosis is based on the radiographic findings, but the degree of disability is judged solely on clinical evidence. Careful observation and a study of the results of the running tests have persuaded the members of the Commission that the disability in mine workers in Broken Hill attributable to pneumoconiosis has been acquired when the men had been working in other mines. In short, they are not prepared to admit that there is any definite disability traceable to uncomplicated pneumoconiosis caused by the inhalation of the dust of the Broken Hill mines. On the other hand, they find that a person affected with fibrosis of the lung is more susceptible to pulmonary tuberculosis. In other mines it has been found that the susceptibility to and vulnerability toward pneumonia is increased by pneumoconiosis. There is not sufficient evidence available to show whether this applies to Broken Hill or not. Many men exposed to dust at Broken Hill do not acquire pneu-

moconiosis; not every man with pneumoconiosis becomes infected with tuberculosis. But the disability of pneumoconiosis in Broken Hill mines appears to be due to the superadded infection. The infection rate is considerably higher among those with pneumoconiosis than among those unaffected.

A discussion concerning the ages of the affected men reveals that the first signs are but rarely discovered in men younger than forty years. The youngest man was about thirty years of age. The greatest number of affected men for both the first and second stage was in the forty-six to fifty age group. It is pointed out that, with the exception of the thirty-one to thirty-five age group, there is no significant difference in the age incidence of second stage pneumoconiosis and pneumoconiosis complicated by tuberculosis. The members of the Commission suggest, subject to correction after more experience has been gathered, that the disease progresses from the first to the second stage within ten years.

Complications of Pneumoconiosis.

Blood pressure estimations and examination of the urinary system revealed that cardio-vascular and renal disease occurred in twenty-four men suffering from pneumoconiosis without tuberculosis.

The number of men with pneumoconiosis infected with tuberculosis was fifty-nine. In 70% the clinical signs and symptoms were obvious. Full details are given of the duration of the tuberculous disease when this could be ascertained, of the attendant disability, of the detection of tubercle bacilli and other matters essential for a proper record. The radiographic signs of pulmonary tuberculosis are described and depicted. The tuberculosis may become superimposed on either Stage I. or Stage II. pneumoconiosis. In the former case there is a further increase of the hilum shadow, together with symmetrical linear markings. There is also a localized increase of mottling, which is usually situated in the sub-apical region. According to the extent of the tuberculous lesion, the localized areas vary from mere peribronchial mottling to massive consolidation. When the infection is added to pneumoconiosis in the second stage, in addition to the uniform mottling of the whole of the affected area, there are localized patches of broncho-pneumonic infiltration or even a dense diffuse fibrosis.

It is pointed out that the Röntgenographic evidence of tuberculous involvement of the lungs in Broken Hill miners is more definite than in the case of miners in other countries, on account of the relatively small amount of dense fibrosis which tends to mask the areas of tuberculous consolidation. The diagnosis has at times to be based on the skiagram. Instances were met with in which the clinical signs and symptoms were quite inconclusive, while the skiagram revealed extensive areas of consolidation.

As stated above, thirty-nine men were suffering from pulmonary tuberculosis without pneumoconiosis. These infections were of many types, from early lesions of one apex to extensive involvement of both lungs. Some of the infections were extremely active, while others were chronic and produced little disturbance of health. A description of the skiagraphic appearances of the lungs in uncomplicated pulmonary tuberculosis is given and two beautiful skiagrams are reproduced. It is evident that the problem of appraising the significance of tuberculosis as a complication of pneumoconiosis becomes extremely difficult in view of the occurrence of a considerable amount of the disease among miners not affected with pneumoconiosis. The age incidence of uncomplicated pulmonary tuberculosis is considerably earlier than that of pneumoconiosis complicated by tuberculosis.

Pathology of Pneumoconiosis.

Eight miners died in the Broken Hill Hospital during the period of the investigations by the Commission and their bodies were subjected to examination after death. Two of these men had been examined previously by the members of the Commission. Five had uncomplicated pneumoconiosis, including one who had been examined; two had pnueumoconiosis complicated by pulmonary tuberculosis, including one who had been examined previously; one had no lung fibrosis. In its early stages pneumoconiosis produces very little gross change. When the lungs are examined under the microscope collections of dust particles are seen and some fibrosis around the small blood vessels and bronchioles. Occasionally there are discrete fibrotic patches, whose arrangement is neither peri-bronchial nor peri-vascular. The amount of fibrosis, while appreciable, is not sufficient to produce any constriction of the blood or air channels. The alveoli contain dust particles, but their walls are not thickened.

In the more advanced cases numerous, small, sago-like nodules were found spread over a large area of the lungs. These nodules were hard and fibrous. Microscopically it was seen that there was a fine interstitial fibrosis, with thickening and catarrhal changes of the alveolar walls. Some of the alveoli were choked, while others were obliterated by dust. It would thus appear that the skiagraphic appearances correspond to the pathological changes.

Cardio-Vascular and Renal Disease.

In the course of the examination it was discovered that 361 men manifested some signs of cardio-vascular or renal disease. Precautions were taken to insure that the blood pressure readings were taken under uniform conditions. Of the 361 men, 56 had a high blood pressusre with definite signs of myocardial changes and albuminuria. Only four of these men were suffering from pneumoconiosis. Their ages ranged from 18 to 72 years. The systolic blood pressure varied between 150 millimetres of mercury in a man of eighteen years to 280 millimetres in a man of forty-five years. The diastolic pressure varied between 70 millimetres and 170 millimetres, while the pulse pressure lay between 10 millimetres and 159 millimetres. Increased blood pressure and albuminuria were present, but no signs of myocardial disease in twenty-seven men. Increased blood presssure and cardial changes without albuminuria were noted in eighty-two men, while increased blood pressure without myocardial or renal changes was found in eighty-four men. The urine in seventy-seven of these men was tested for lead. Lead was present in the urine of forty and absent from the urine of thirty-seven men. In seventeen instances there were no signs of cardio-vascular or renal disease and yet lead was detected in the urine. Attention may be drawn to the fact that the urine was tested for lead in the absence of signs of cardio-vascular or renal disease only forty times, so that in nearly one-half the men were excreting lead in their urine. The actual cause of the cardio-vascular and renal changes was not further investigated.

Ætiological Factors.

A careful survey was made of the records of the men examined to ascertain the length of exposure to dust and the nature of that exposure. Pneumoconiosis apparently exists only among practical miners. There were 471 men who had worked at Broken Hill, but not elsewhere, for ten years or less. Of these men, seven were affected with the first stage and two with the second stage of pneumoconiosis. This implies that among men with ten years' exposure or less to the special dust of the Broken Hill mines, 1.9% had become affected. Of the number of men who had worked as practical miners at Broken Hill but not elsewhere for over ten and under twenty years, ten were in the first stage and four in the second stage of pneumoconiosis. This is equivalent to a frequency of 4.7%. In addition, 3% had pneumoconiosis complicated with tuberculosis. There were 140 men who had worked similarly for over twenty and under thirty years. Fourteen had pneumoconiosis in the first stage, one had the affection in the second stage and nine had tuberculosis as well. The frequency was 10.7% of uncomplicated and 6.4% of complicated pneumoconiosis. Lastly, there were nineteen men who had worked as practical miners at Broken Hill but not elsewhere for over thirty years. Two had first stage pneumoconiosis, one had the condition in the second stage and four had it with tuberculosis, making seven persons in all, or 36.8%. A comparison is drawn with the men who had worked as practical miners both at Broken Hill and elsewhere. The incidence was 2.5% for periods under ten years, 16.9% for periods over ten and under twenty years, 26.8% for periods over twenty and under thirty years and 26% for periods over thirty years. In all, there were 1,697 practical miners, of whom 180 were

affected with pneumoconiosis. Only thirteen other persons in Broken Hill were found to be suffering from this condition. It is therefore claimed that pneumoconiosis is an affection of men who work with a machine drill. Much further information of importance and interest is given concerning the form of work and the length of employment. It is impossible to give these details in this place.

Nature of Broken Hill Dust.

The question of the nature of the dust inhaled in the mines of Broken Hill has received a considerable amount of attention from the members of the Commission. In the first place, it was found that the mineral lode is very complex. The lode contains, in addition to the valuable galena and blende, a large proportion of valueless material in which a variety of minerals are present. This useless material is spoken of as gangue. The gangue appears to be of two types, the calcite or carbonate gangue and the rhodonitic or siliceous gangue. An analysis of the crude ores reveals that in the siliceous there is, in addition to 33.3 grammes of silver per hundred kilograms, 15.5% of lead, 17% of zinc, 13.8% of sulphur, 4.9% of iron, 4% of calcium oxide and smaller amounts of copper, arsenic, antimony, aluminium, manganese, etc.. The substances insoluble in nitro-hydrochloric acid represent 37.71% of the siliceous ore. It consists of 67.6% of silica, 19.5% of manganous oxide and 3% of lime. The calcite ore contains, in addition to nine grammes of silver per hundred kilograms, 13.4% of lead, 15.7% of zinc, 12.6% of calcium oxide, 11.6% of carbon dioxide, 9.7% of sulphur, 3.03% of iron and smaller quantities of the other ingredients. The material insoluble in nitro-hydrochloric acid represents 13.4% of the ore and this contains 56% of silica, 17.7% of manganous oxide, 13.3% of calcium oxide and 6.6% of ferrous oxide. Nine different ores from the nine mines in Broken Hill were found to produce ores differing considerably in composition. The highest proportion of material insoluble in nitro-hydrochloric acid was 60.5% and the lowest 12.72%. The amount of silica in this insoluble material varied between 86.75% and 53.25%. The percentage of lead varied between 11.27% and 16.18%.

Further analyses were undertaken to determine the composition of the lode. The percentage of free silica in the lode varies in eight of the nine mines from 7% to 17.7%, while in the ninth mine it is as low as 1.6%. The Commission consequently expresses the opinion that the proportion of silica or quartz in the Broken Hill lode is low. Unfortunately, the mines were not working during the period of investigation and the dust conditions could not be examined accurately. Some blasting was conducted for the purpose of obtaining samples of typical dust. A full description is given of the apparatus employed for the purpose of collecting and measuring the dust. This apparatus has been carefully devised and is reliable and accurate in its working. After the blasting the amount of dust in four mines collected was found to be 67.8 milligrammes per cubic metre, 33 milligrammes, 5.4 milligrammes and 2.5 milligrammes per cubic metre. The dust is divided into calcitic, siliceous, rhodonitic and oxidized. In the calcitic the insoluble fraction represented 7.25%, the lead dust represented 35.66% and the zinc dust represented 15.2%. In the siliceous dust the insoluble material represented 13.36%, the lead 34.59% and the zinc 25.07%. In the rhodonitic the insoluble material represented 44.2%, the lead 7.5%. In the oxidized the insoluble material represented 44.18% and the lead 5.88%. An examination was made to determine the rate of settling of the different particles of the dust of the calcitic dust. The insoluble material settled very slowly, only 17.91% having fallen in 85 minutes, while 57.98% of the lead had fallen and 35.84% of the zinc.

In South African mines and elsewhere it has been found that quartz particles penetrate deeply into the lungs of the miners and give rise to intense fibrosis. Since the mineral lode and the dust from the lode in Broken Hill contains relatively little free silica and is of very complex composition, the problem is by no means a simple one. Samples of the lungs of miners who had died of some independent affection, were examined for the chief ingredients of the lode dust. The results were compared with the results of the chemical analysis of lungs of persons who had died in Sydney and who had not followed the occupation of miners. The analyses were carried out by ashing in a muffle furnace and by extracting the ash first with sulphuric acid and after evaporation to dryness with ammonium acetate. From these extracts the amount of lead was determined. The ash was further extracted with hydrochloric acid and nitric acid for the determination of zinc and manganese. The residue was employed to ascertain the siliceous content. The control lungs yielded an average of 1% of ash, of which 5.7% was insoluble. The amount of manganese in the normal control lungs was 0.0013% of the ash. No lead was detected. The miners' lungs yielded an ash representing 1.228% of the total weight. The maximum amount was 1.99% and the minimum was 0.703%. The insoluble fraction of the ash weighed 29.6% of the weight of the ash. The maximum was 51.6% and the minimum 7.4%. The amount of manganese was much increased. It weighed 0.12% of the weight of the ash, that is, the amount was one hundred times greater than the manganese in the control lungs. The lead, which was found in all lungs but that of a man who had not worked underground for twelve years, averaged 0.037% of the weight of the ash. The amount of zinc in the miners' lungs was 3.5 times as great as that in the control lungs. The fact that the lungs of the miners contained lead, manganese and silica was taken as conclusive evidence of the accumulation of the mine dust in the lungs of the men exposed to it, even although a considerable time had elapsed since these men had worked underground. It was shown that the silica in the lungs of the miners averaged 0.42 to every part of soluble ash, as compared with 0.065 in the case of the control lungs. The silica exceeded the amount of soluble ash in one lung. This man, however, had worked for sixteen years elsewhere and nineteen years at Broken Hill. Remarks are made concerning the exceptional results obtained in the analyses. These include the absence of silicosis of the lung and the very insoluble fraction of the ash in a miner who had worked for eight years as a miner, of which six had been spent at Broken Hill. From the limited evidence, it would appear that there is no qualitative relation between the period of working underground and the amount of dust accumulated in the lungs.

It is shown that the particles in the lungs were with very few exceptions less than 7.5μ in diameter. It has been claimed that quartz particles of a diameter of less than 7.5μ do not give rise to extreme forms of fibrosis.

The Hookworm Investigation.

Dr. W. A. Sawyer and Dr. C. P. Rosenthal submit a report on the investigations into the question of a possible hookworm infection in the Broken Hill miners. Some 3,800 mine workers were examined, but none was found to be infected. It is thought that men with anchylostomiasis have come from time to time to Broken Hill, but that the infection has not obtained a foothold. Evidence is adduced to show that the absence of anchylostomiasis is not due to a parasiticidal action of the salt present in the mine waters, since the ova are capable of hatching to larvæ in the water. The sanitary conditions of the mines have been carefully investigated and were found to be relatively satisfactory. The men are responsible for the absence of soil pollution. Pail latrines were provided when the mines were first opened.

Pulmonary Tuberculosis Complicating Pneumoconiosis.

Since the Commission has found that the dust in the Broken Hill mines leads to a form of pneumoconiosis which in its uncomplicated form is practically devoid of clinical manifestations, but which predisposes the individual to a fatal tuberculous infection, the recommendation has been made that no persons suffering from pneumoconiosis should be allowed to work along the line of lode. It is suggested that miners found to be so suffering, should be placed in some open-air occupation, either pastoral or agricultural. Under these conditions the affected men would be less exposed to a tuberculous infection. They should, however, be kept under continuous supervision and should a pulmonary tuberculosis manifest itself at a later date, compensation should be paid. It is the opinion of the members of the Commission that skiagraphic examination should be undertaken in the case of all persons seeking employment in the mines.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Queensland Branch was held at the B.M.A. Rooms, Adelaide Street, Brisbane, on October 7, 1921, DR. A. GRAHAM BUTLER, D.S.O., the President, in the chair.

Foreign Body in Œsophagus.

DR. R. GRAHAM BROWN exhibited a foreign body which had been removed from the œsophagus of a woman, aged sixty years. It consisted of a spicule of mutton bone with a piece of meat attached to it. The length of the bone was 2.5 cm. and its maximum width was 4 cm.; it tapered to a sharp point at each end. The meat attached to the bone measured 2 cm. in length by 1.5 cm. in breadth and depth. He also showed a skiagram of a woman's neck, revealing a foreign body (mutton bone) in the upper part of the œsophagus. Dr. Graham Brown said that he had brought these cases before the attention of members in order to demonstrate the serious results that might follow an attempt to dislodge the sharp foreign body with a probang. He stated that this obsolete instrument should not be used in any circumstances. He recited instances in which death had been brought about by its use.

DR. A. GRAHAM BUTLER asked Dr. Graham Brown whether he thought that the œsophagoscope was an instrument which might be used generally and more especially in the country. The majority of practitioners could recall instances in which the probang had apparently assisted in displacing a foreign body in the œsophagus, either upwards or downwards. Though the instrument might be crude, it was at times the only one available.

DR. GRAHAM BROWN held that the use of the probang in cities was quite unjustifiable. He asked those present to consider how many foreign bodies they had seen in the œsophagus that had been removed by a probang. Only those foreign bodies which had been arrested in the buccopharynx and possibly the laryngo-pharynx could be removed by the probang. He recommended the following procedure: The treatment at first should be palliative, because the majority of persons complaining of foreign bodies in their throats only had an abrasion in the neighbourhood of the pillars of the fauces or in the pyramidal fossæ. If the patient returned on the following day, still complaining that a foreign body was present, a skiagram should be taken. If there was evidence of a jagged bone, there was only one logical line of treatment: the œsophagoscope should be used. If this instrument were not available in country districts, he would recommend in the place of a probang a soft rubber tube, such as a stomach tube. This should be passed down the œsophagus. In cities and towns the patients should always be referred to the throat department of a public hospital.

Syphilis of the Nose.

DR. GRAHAM BROWN also showed a patient with a syphilitic tumour of the nose resembling a rhino-fibroma. He announced that he would again bring the patient to a subsequent meeting of the Branch after he had had a full course of nov-arseno-benzol.

Specimens.

DR. E. CULPIN presented a rhinolith formed around the root of a tooth and imbedded in the floor of the nose near the inferior turbinate. He also showed a fish-bone removed from the larynx.

DR. A. T. NISBET showed a skiagram of an aneurysm of the ascending aorta and a second skiagram of the chest of a patient to illustrate the condition of "soldier's heart."

Preventive Medicine.

DR. W. A. SAWYER read a paper entitled "Some Directions in Which Advances in Preventive Medicine Could be Made in Queensland" (see page 141).

DR. J. V. DUHIG thanked Dr. Sawyer for his valuable paper and the International Health Board for the excellent work that had been carried out in Queensland. The money spent was an excellent investment and would command a handsome return in the increased health and efficiency of the future citizens of the State. He expressed the fear that when the Board finished its work in the north in 1924 official lethargy would allow things to lapse into the chaos of pre-Rockefeller days. The north had been badly treated. In this regard it could not be said that the Australian Institute of Tropical Medicine had fulfilled their expectations. Sprue, for instance, was endemic and severe in certain areas. Only very desultory efforts had been made to investigate the problems of this disease. The people in the south were not alive to the great difficulties in the way of disease confronting settlers in the north; public opinion should be guided into these channels. The whole subject of preventive medicine needed urgent attention. With that object the Queensland Branch had formed a public health sub-committee to assist practitioners in the matter, to urge action by the Government and to form an enlightened public opinion. This sub-committee was working in conjunction with the Public Health Association of Australasia. In conclusion, Dr. Duhig referred to the interesting fact brought out by the Australian Hookworm Campaign, that the predominant infestation in Queensland was by the *Necator*, the anchylostome being relatively rare. He had found Dr. Darling's work on this subject especially good.

DR. A. C. F. HALFORD said that he had been impressed by the simple effectiveness of the measures outlined by Dr. Sawyer and by the due regard being given to economy in execution. They should be grateful for this plan of campaign and see that it did not share the fate of so many health reforms which could only live in the sight of danger. Every man in the community who had grounds for fear, threw himself into the fight with fervour, but he went to the aid of a neighbour with a pre-occupied air. "We are here to help others," said the teacher. "What are the others here for?" asked the pupil.

DR. J. LOCKHART GIBSON said that as far as he could ascertain, the first infection with anchylostome in an adult in Australia occurred in 1893. At the request of the Superintendent of the Dunwich Benevolent Asylum he had seen a man who was thought to be suffering from pernicious anæmia. Microscopical examination of the blood had not borne out the diagnosis. The man had been told to pass a stool, which was then examined. Hookworm ova had been discovered. The case had been reported to a meeting of the Queensland Medical Society. The red blood cell count revealed 1,200,000 cells in each cubic millimetre. Soon after the man died of influenza, his debilitated condition being a contributory cause of death. Dr. Gibson performed a *post mortem examination*. In the small intestine uncountable worms were found. A portion of the intestine had been shown at the meeting of the Medical Society. The presence of anchylostomes in children had been diagnosed earlier in 1892 in Cairns and Mackay. In 1889 Dr. Hogg, of Goodna, had discovered the worms *post mortem*. This was the first discovery of anchylostomiasis in Australia. The great difficulty in those days lay in the fact that they did not know how to kill the worms. In the case of adults surviving the infective (bootless) stage of life, if untreated and heavily infected, recovery could only take place without treatment by the death of the worms in the intestine. This evidently happened at times. The debility produced by the presence of the worms must be a factor in determining the severity of the course of other illnesses. Treatment of anchylostomiasis, both in adults and in children, was essential, as the life of the worm was long.

DR. D. GIFFORD CROLL drew attention to the earliest hookworm campaign in Australia, conducted by one individual. Dr. Croll thought that it was at his own expense. This was fifteen or twenty years previously. Patients were being admitted to the Children's Hospital in Brisbane from the north coast with hookworm infection. Dr. Turner had leaflets printed, setting out the essential facts of the ætiology of the disease. When a child was admitted, the leaflets were distributed in the place where it had resided. This was a small, but commendable attempt on the part of one individual to face a duty which was being neglected by those responsible. He had been surprised to hear from Dr. Sawyer of eighty infections which had occurred in

Brisbane. He asked for information concerning the possible mode of origin of these infections.

DR. P. J. KERWIN commented on the lack of assistance to practitioners in northern Queensland in their disease problems. The north had been allowed to a large extent to "stew in its own juice" in the past.

DR. S. F. MCDONALD said that the greatest work of the Australian Hookworm Campaign had been in its educational achievements. To anyone who knew the average bush latrine and the views on sanitation of the average bush householder, it would appear simply marvellous that throughout the hookworm districts every house had been provided with clean, fly-proof and decent closets, such as might be sought in vain in Brisbane itself. Some members of the medical profession might be willing to rest content with the present state of affairs. He thought that if Dr. Graham Butler, for instance, had found his divisional latrines in the conditions normal for Brisbane latrines, some deputy assistant director of medical services would have had a bad quarter of an hour and a hurried change of work. It had been said in reply to this form of criticism that in France they had had the Army behind them. Dr. Sawyer had had no army behind him, nothing but brains, ideals and enthusiasm. In Brisbane there was a regulation that all new latrines should be fly-proof. This regulation was being disobeyed with impunity. It would require little to make Brisbane a clean city, but perhaps a beginning might be made with a capable, independent and full-time medical officer of health. The city was reaping the neglect of public health in typhoid fever, dysentery and plague.

DR. A. GRAHAM BUTLER recognized in the remarks of the various speakers their sentiments toward the work of Dr. Sawyer, his staff and the International Health Board. He felt strongly that an obligation rested on the community, on the medical profession and on their Branch of the British Medical Association to see that the measures dealing with anchylostomiasis initiated by Dr. Sawyer should be carried out in the manner described in Dr. Sawyer's admirable paper. As a community and as a profession they were deserving of no small blame in allowing this disease to obtain so strong a hold. It would be an ignominy should they allow themselves to relapse into the slough from which they had been drawn. In the scheme put forward by Dr. Sawyer the mind of the master builder could be discerned, who made provision for the completion of his work on the wise and broad lines on which he had conceived it. There was, he thought, in the presence of Dr. Sawyer with them something more significant and of wider concern than the mere stamping out of a disease in a small community. Dr. Sawyer was an American. What had brought him to Australia? What was the meaning of the International Health Board? It seemed to him that they could appreciate the existence of a movement of world-wide significance. The idea of international cooperation against the forces destructive of civilization, instead of mutually destructive international competition, was the essential part of this scientific and philanthropic American organization. There was a great tendency to internationalize scientific preventive measures against disease. They should take their part among the civilized nations. They should not be a menace to others and a disgrace to themselves. He tendered to Dr. Sawyer the hearty thanks of the meeting for his paper and to him and the organization he represented their appreciation of the work which was being carried on in so successful a manner.

DR. SAWYER, in his reply, said that he appreciated the reception given to his paper and especially the evidence of understanding and approval of the objects of the International Health Board. He pointed out that in voicing their thanks for the work done, they were thanking an organization which was at least half Australian, both as regards money and as regards workers. A certain degree of pessimism had characterized the remarks of some of the speakers. He could not concur in this. He believed that, the difficult and costly part completed, there would not be wanting either organization or funds to insure its adequate continuance by both Federal and State authorities. His object had been to outline the scheme which had been worked out as the simplest and most inexpensive, as well as efficient, for insuring the permanence of the results. In connexion with health matters in general he had found Australia particularly fitted for obtaining the best results. The public and the press and also the legislature had seemed to him as ready as in any community in which he had lived to take up intelligently and sympathetically movements for the betterment of the public health. There was, for example, an almost complete absence of "organized ignorance," at least of harmful manifestations of it. He forecasted a wonderful future for the country.

In reply to the direct questions, Dr. Sawyer said in regard to treatment that it had been found that patients should not be over-prepared by purgation and starvation. It was quite safe to give the appropriate dose of oil of chenopodium on an empty stomach in the morning. Preliminary starvation and purgation were unnecessary and harmful. In referring to the question of cure in adults, he asked his audience to remember that the removal of the worms would not restore lack of development caused by their previous action, though great improvement might result.

Concerning the distribution of the species of hookworm, he mentioned the work of Draling, who had described the influence of nearness or distance from the equator in determining the relative frequency of *Necator* and *Anchylostomum*. Their observations in Australia had not confirmed the idea of any direct connexion. *Necator americanus* was the prevailing worm in all parts of Australia.

The resolution of the Australasian Medical Congress, Brisbane, 1920, urging a preliminary survey of malaria and filariasis in conjunction with the hookworm survey had been borne in mind. Some results, though not at all complete, would be forthcoming before long. He hoped to extend the inquiry.

Medical Societies.

MELBOURNE GYNÆCOLOGICAL AND OBSTETRICAL SOCIETY.

A MEETING of the Melbourne Gynæcological and Obstetrical Society was held in the lecture room of the Melbourne Hospital on July 28, 1921. The chair was taken by DR. R. H. MORRISON.

Carcinoma Uteri.

DR. A. NORMAN MCARTHUR read a paper entitled "The Course and Treatment of Carcinoma Uteri" (see page 145).

DR. THOMAS MURPHY described Dr. McArthur's paper as a very practical statement of the difficulties attending the treatment of carcinoma of the cervix. While he agreed that it was highly desirable that there should be an ample supply of radium accessible to medical men for the treatment of cancer, he did not favour the suggestion that it should be made available out of funds provided by the Government. If the Government supplied the money, it would follow that there would be some degree of Government control in the use of the radium and there lay his objection to the proposal. It was not advisable to invite outside control in matters which were essentially the concern of the profession.

In the field of preventive medicine State activities were essential and the profession were bound to do all in their power to assist, but in the treatment of disease they should not be in any way under the direction of an outside body. He would suggest that the cost of sufficient radium was not so excessive that it could not be secured by the medical profession. In any case, if any central controlling body were necessary, that controlling body should be their own organization—the British Medical Association.

Dr. Murphy said that his experience with regard to the formation of fibrous tissue after treatment by radium seemed to be at variance with that of Dr. McArthur. He had frequently observed the formation of fibrous tissue in these cases around the position of the cancerous mass which had been destroyed by the use of radium. In several cases in which there had been great infiltration of the cervix by cancer, the cervix had seemed to disappear alto-

gether and a crateriform cavity had taken its place, this cavity being surrounded on all sides by fibrous tissue which gradually contracted down, tending to obliterate the cavity.

There was no doubt that preliminary radiation rendered operation more practicable in many instances. Operation in advanced cases almost always involved cutting through tissues permeated with cancer cells. These cells were grafted into the incision, with the result that the disease spread more rapidly. Cancerous cells were particularly vulnerable to radium and after radiation such cells as were not killed, were often wounded to such an extent that they lost their power of propagation and growth, so that pre-operative radium treatment lessened the likelihood of recurrence. Pre-operative radiation was also of great value in patients weakened by excessive bleeding. Here it stopped the loss of blood and allowed the patient to gather strength for the operation.

With reference to the subject of early diagnosis, Dr. Murphy was of opinion that reproach for overlooking advanced cancer of the uterus was sometimes cast on the medical man when it was not just. He quoted an instance where the disease was of at least twelve months' duration before any bleeding or other irregular discharge attracted the patient's notice; he said that such cases were not uncommon. Again these discharges of blood or watery fluid were often neglected by the patient herself for a considerable time.

With regard to radium treatment, an important distinction should be drawn between carcinoma of the body of the uterus and carcinoma of the cervix. While advanced disease of the cervix was particularly suited for radium treatment, cancer of the body was amenable to eradication by operation and the results attending the operation were very good. He would not advise radium in the latter class of case, except as a preliminary measure in an exsanguinated patient to stop bleeding and allow the sufferer to gain some strength. He instanced a case of this kind where the condition of an anæmic and otherwise unhealthy patient of seventy-five years of age was so improved that she recovered from the operation which, in his opinion, would, without the use of radium, have probably led to a fatal result.

In conclusion, Dr. Murphy agreed with Dr. McArthur as to the importance of inserting the radium within the cervix. In one or two, however, he had found this impossible at the first application. In these cases of advanced disease of the cervix, on account of the severity of the hæmorrhage and the friability and fixation of the cervix, he had had to be satisfied with placing the radium in contact with the growth and plugging, for the dual purpose of holding the radium in position and stopping the bleeding. In later applications it was found that the bleeding did not recur. There was one danger to be guarded against in these cervical cases. Some of them so improved after one or two applications that they considered themselves cured and neglected to apply for further treatment. It was wise to warn patients of this danger and to keep them under observation for a long time.

DR. C. E. DENNIS said that at the Women's Hospital, Melbourne, there was sufficient radium bromide (130 milligrammes) for the treatment of the great majority of cases. In carrying out irradiation he based the dosage on that of Janeway and of the Radium Institute of London, which was practically that recommended by Dr. Howard Pinch, *viz.*, 1,100 to 2,000 milligramme-hours, with an average of 1,600 to 1,700. The appropriate number of milligramme-hours depended to a large extent on what filters were employed; he generally used a tube of 0.5 millimetre of silver and 1.5 millimetres of brass, encased in rubber; but in treating carcinoma of the cervix he dispensed with the rubber covering on the tube inserted in the cervix. He had not experienced any serious trouble from hæmorrhage and it was the general opinion that the radium should be inserted within the cervix. If radium needles were available, they might be placed in the cervix along with tubes in the vaginal fornices, in order to secure the cross-fire effect.

Dr. Dennis said that in his work at the Women's Hospital it was his practice to give 1,600 milligramme-hours three weeks prior to operation. Inquiries had shown that no special difficulty attended operating at this interval after irradiation; there was perhaps a little more oozing than usual, but if operation were left to a later period the formation of fibrous tissue might occasion great trouble in finding the ureters. He urged that operation should always be performed within three weeks of irradiation. After preliminary treatment by radium many apparently inoperable cases became much less formidable and in less advanced cases, ulcerating and friable tissue would disappear before the operation.

He had often noted that women looked in better health after radium application and they constantly said that they felt better. In a similar manner, patients under treatment by X-rays, provided the dosage was not too heavy, gained in weight and looked and felt better. A tonic effect of the rays certainly occurred and it was well observed in the treatment of cancer of the cervix by radium.

Carcinoma of the cervix was, *par excellence*, a disease for radium therapy; on the other hand, as English and American observers had pointed out, cancer of the body of the uterus did not respond to treatment by radium nearly as well as cancer of the cervix. Fortunately, the former was much more amenable to operative measures, but these should be supplemented by a prophylactic dose of radium after the operation. A good routine for operable cases was preliminary radiation, operation within three weeks and a further radiation after the wound had healed.

Dr. Dennis said that in the treatment of inoperable cases of cancer of the cervix he frequently applied radium over the skin of the abdomen. Tubes were placed over either flank and the filtration was through 0.5 millimetre of silver, 1.5 millimetres of brass and 1 millimetre of lead. Only the most penetrating rays would get through to the invaded tissues, but no doubt some would thus augment the vaginal dosage.

He had not experienced any serious after-effects of radium therapy, such as the "radium sickness" which had been described as following heavy dosage; occasionally there would be complaint of nausea while the radium was in the cervix.

It was imperative to proceed cautiously, to avoid overdosage and to strive for a dosage which could be relied upon as lethal to the cancer cells, but innocuous to the healthy tissues of the bladder and intestine..

DR. E. A. SPOWERS said that in dealing with apparently inoperable carcinoma of the cervix he had noted that a small proportion of cases offered a better prospect of successful surgical treatment after the patient had been induced to take three weeks' rest in bed. This apparent amelioration of the condition was due to the fact that a good deal of the infiltration was of an inflammatory nature and until it subsided under the influence of rest, it conveyed an impression of a more wide-spread malignant invasion than actually obtained.

It was unfortunately true that the great majority of patients were not amenable to surgery when they came under the care of the gynæcologist; after a fifteen years' experience at St. Vincent's Hospital he would place the proportion of cases which could be classed as operable at 2%. While no doubt the responsibility for this state of affairs frequently lay with the general practitioner, as had been emphasized by Dr. McArthur, it was not invariably so. Little notice would frequently be taken of slight sanious or watery discharge by the woman herself for many months and perhaps the busy general practitioner was prone to allow such apparently slight discharge to go uncorrected and uninvestigated. He considered that a woman with such an irregular discharge should be referred at once to a gynæcologist, in the same routine manner as a patient with a defect of sight or hearing was referred to the oculist or aurist.

DR. R. F. O'SULLIVAN agreed with Dr. Spowers in his estimate of the very small proportion of "operable" cases of cancer of the cervix among hospital patients affected with this condition. It was a deplorable state of affairs, but the emphasis laid on the large number of inoperable cases recalled to him an experience which he might mention.

A woman attended St. Vincent's Hospital on account of difficulty in urination which had been troubling her for an

indefinite time. She had been married some years and had had several miscarriages; there had been some irregular vaginal hæmorrhage. On attempting to make a pelvic examination he was unable to get a finger into the vagina because of the obstruction offered by what was apparently a malignant growth. However, the blood serum yielded a Wassermann reaction; treatment was instituted with novarseno-billon and at the present time the growth was diminishing and there was no difficulty in micturition.

Dr. O'Sullivan said that he could confirm Dr. McArthur's observations regarding the peculiar gelatinization of the tissues in the field of operation after the application of radium. He had noted this peculiar mucoid tissue on more than one occasion and had wondered whether it was a precursor of fibrous tissue.

He thought that careful inquiry would show that the association of malignant disease with uterine fibroids was more frequent than was generally admitted. It was a not uncommon experience to find malignancy co-existing with an apparently innocuous fibroid.

DR. ALLEN ROBERTSON remarked that the possibility of radium effecting a cure in cancer of the cervix was a matter for further experience to determine, but there could be no doubt that it was of very great assistance to the surgeon. Up to the present he had found no instances recorded in which radium had displaced surgery. It had been shown to be capable of keeping the disease in abeyance for a year or two, but the malignant process had ultimately progressed.

He had gained an impression from reading that the gelatinous tissue sometimes encountered after irradiation was to be interpreted as an evidence of over-dosage by radium.

With reference to Wertheim's operation, Dr. Robertson said that he thought this extensive procedure had been abandoned. To clean the pelvis thoroughly of its numerous ramifications of lymphatic vessels and abundant lymphatic glands was a formidable task and it was very doubtful whether the real objective was ever attained. He suggested ligation of the internal iliac arteries as an effective method of controlling much of the hæmorrhage in advanced and inoperable cases of carcinoma of the uterus.

DR. EDWARD WHITE said that his own experience unfortunately compelled him to concur in Dr. McArthur's statement that practically all women affected with carcinoma of the cervix delayed in seeking operative treatment until it was too late. He might say that all cases of cancer of the cervix appearing in his out-patient clinic at the Women's Hospital were found to be too advanced to warrant an attempt to eradicate the disease surgically. Lack of initiative on the part of medical practitioners was not the only factor contributing to this state of affairs, for, as Dr. Spowers had pointed out, many women sought no attention until they experienced pain. Any woman at any time of life with an irregular bleeding or non-leucorrhœal discharge should be referred to the gynæcologist in order that malignant disease of the uterus should not continue to be overlooked in its earliest stages. Although the best results attended operation in the very early stages of the disease, it appeared that in what might be classed as border-line cases, operation with radium as an adjuvant offered fair prospects.

Dr. White expressed himself as in agreement with Dr. Spowers on the advantage to be gained by giving a patient, whose prospects of successful operation appeared doubtful, a rest in bed for three weeks. There was no doubt that much of the infiltration and consequent apparent fixity of the neoplastic mass was inflammatory in nature and aggravated by the woman going about. Rest in bed, before more active treatment, would often definitely lessen this fixation.

In the early days of radium therapy excessive dosage frequently led to the occurrence of recto-vaginal and vesico-vaginal fistulæ, but with riper experience radiologists had eliminated these unfortunate sequelæ. It seemed to him that in the irradiation of cauliflower growths which occasioned much hæmorrhage and discharge, an initial short exposure was to be preferred to a longer, *i.e.*, twenty-four hours, as it was inadvisable to plug the vagina for too long a period in the presence of much offensive discharge.

DR. A. M. WILSON asked had Dr. McArthur had any experience which might indicate a relationship between syphilis and carcinoma of the cervix such as that recognized between syphilis and cancer of the tongue and, further, had Dr. McArthur ever observed cancer in a cervix which had never suffered trauma from dilatation?

DR. R. H. MORRISON conveyed the thanks of the meeting to Dr. McArthur and took opportunity to contribute to the discussion.

He had notes of six cases of cancer of the cervix occurring in women under thirty years and in four of these patients the serum yielded a Wassermann reaction. The most malignant growth of this nature he had ever seen was in a woman aged twenty-five. The diagnosis was made microscopically before operation, which took place on June 30. The patient was discharged from hospital on July 17 and died in October of the samé year.

Experience showed that operative procedures must always be, to some extent, exploratory in nature. It was impossible to tell at the outset how far it would be possible to proceed, if at all; the operation might be brought to a standstill by the presence of an extensive involvement of the bladder, ureters and pelvic lymphatic glands.

With reference to vaginal hysterectomy, Dr. Morrison said that he had seen Schauta perform the operation and he personally was of opinion that Schauta's method enabled the surgeon to obtain a clean field of operation. Schauta's primary mortality was very low compared with that of Wertheim, but the end results of his operation were not so good.

At the time when he (Dr. Morrison) was in Vienna, Wertheim had completed the seven hundred and fourteenth instance of the operation which was known by his name, but Wertheim himself had latterly preferred the vaginal operation in very fat women.

Wertheim's immediate mortality in the first 100 performances of his extensive operation had been 31%; at a later period he succeeded in effecting a reduction to 12%, but in the last 100 of the series the operative mortality had been 17%.

In regard to the part to be allotted to radium in the treatment of malignant disease of the uterus, Dr. Morrison indicated that Latzko, in Vienna, used to irradiate three weeks before operation and apply 125 milligrammes for twelve to fifteen hours. If conditions were favourable at the end of three weeks, the surgeon referred to proceeded to operate; otherwise he employed a further irradiation.

He understood that Latzko had latterly abandoned preliminary irradiation on account of difficulties experienced in freeing the ureter after the use of radium. For himself, he had been guided by these experiences and employed radium after operation.

Howard Kelly, the protagonist of radium therapy in cancer of the uterus in America, taught that radium was superior to operative measures and that better ultimate results were to be obtained by radium alone than by surgical measures with or without radium.

In some remarks on operative technique, Dr. Morrison said that it was his practice to suture the peritoneum to the skin of the abdominal incision. Infection of the wound, when it occurred, was prone to involve the subcutaneous planes and the expedient indicated was designed to protect these tissues from infection.

At the conclusion of the operation he sutured the utero-vesical fold of peritoneum to the meso-sigmoid, thus covering in the pelvis. Should any subsequent infection occur, it was thereby limited to the pelvis.

In dealing with cauliflower growths of the cervix, Dr. Morrison preferred hot irons to the Paquelin cautery; only a low temperature was required and the former supplied all the heat necessary.

In the last few years had been very much impressed by the results attending treatment by radium. A striking demonstration of its lethal effect on cancer cells was afforded in the case of a woman whom he had treated last year for recurrence of malignant disease in the vaginal vault. The mass was irradiated on May 5 and at an examination on June 1 no trace of the growth could be found. The vaginal walls were perfectly smooth and the patient had remained free from further trouble for twelve months to date.

DR. A. NORMAN MCARTHUR expressed himself as pleased with the discussion evoked by his paper. In reply to Dr.

Wilson, he said that he had seen a few instances in which a syphilitic lesion and Wassermann reaction with the blood serum were associated with malignant disease of the cervix. As regards the occurrence of cancer of the cervix in the absence of antecedent trauma of any kind, he stated that he had met with a few cases of cancer of the cervix in which the patients were virgins and in whom no history of syphilis could be traced.

Dr. McArthur said that his indictment of the general practitioner had been well considered; he had known of many women actually under medical advice and treatment in whom no attempt had been made at an examination until a flooding ensued.

He considered that a uterus with an extraneous discharge was to be considered guilty of malignant disease until it was proved innocent. The condition in which such a large number of women with undiagnosed malignant disease sought treatment was discreditable to the profession.

In the matter of the radium bureau which he had suggested, he did not care very much how it was established, provided something was done in this direction. The total supply of radium in Victoria was very small and was all in Melbourne; country hospitals had no opportunity of exploiting the valuable properties of radium in the treatment of malignant disease. He thought that the Government should provide the funds, but, of course, the use of the radium in treatment would be in the hands of medical men.

Radium certainly exercised a progressive and improving effect on carcinoma of the cervix; there was no doubt still a good deal to learn about its possibilities and appropriate dosage. If the gelatinized tissue that he had described, were the effect of what is now regarded as over-dosage, it should be the objective in preliminary radiation, for its presence undoubtedly facilitated the operative removal of the growth. He had not encountered so far very dense fibrous tissue induced by irradiation.

Dr. McArthur said that he was in agreement with Dr. Spowers regarding the effect of rest in promoting the resolution of inflammatory processes accompanying malignant disease, but thought that too much time should not be given to rest as some carcinomata of the cervix progressed very rapidly.

The paper afforded no scope for a discussion on carcinoma of the body of the uterus, but he had endeavoured to bring out some of the difficulties attending the eradication of cancer of the cervix—a terrifying disease to the gynæcologist.

In reference to the Schauta method of vaginal operation and its reduced immediate mortality as compared with panhysterectomy on the Wertheim lines, the greater risks of the latter were counterbalanced by the much improved end results.

Public Health.

THE PLAGUE OUTBREAK.

THE following information is culled from Bulletins Nos. 26 and 27, which were issued by the Federal Department of Health on January 13 and 20, 1922, respectively:

General.

It is reported that the Queensland Department of Public Health has determined that the Health Officer of each local authority is responsible for the carrying out, as far as is practicable, of the provisions of the *Health Act* and of the regulations under this Act. The Department has also determined that when plague occurs, either in rodents or in human beings, the cellars, walls and floors of the premises shall be disinfected and all goods shall be raised at least twelve inches from the floor or ground; that sentinel guinea-pigs shall be employed in order to ascertain the presence or absence of fleas and their infectivity or otherwise; that an authorized officer shall inspect goods removed for transit from such premises and shall prevent produce, forage, sacks, etc., from being removed from infected premises until a period of fourteen days shall have elapsed since the detection of the last infection.

The regulation under the *Quarantine Act* dealing with rat guards has been amended to provide for uniform standard. Rat guards which do not comply with the plan and specification may not be used.

Plague in Human Beings.

During the fortnight ended January 14, 1922, four persons suffering from plague and two suspected to be so suffering were admitted to the Wattlebrae Isolation Hospital at Brisbane. On January 17 a man aged 34 years was admitted on account of plague and on January 19 a further patient suspected of having plague was admitted. The two suspects referred to above were subsequently found not to be suffering from plague. The total number of cases in Brisbane up to January 19, 1922, was 52 and the total number of deaths 28.

During the fortnight ended January 14 two persons suffering from plague were placed in isolation. One of these persons was found dead.

No other case of plague in human beings was notified in any part of Australia during the three weeks ended January 20, 1922.

Plague in Rodents.

During the fortnight ended January 14, 1922, 4,741 rodents and 16 cats were examined. There were six infected rodents and one infected cat.

A small number of smears from the spleens of rodents caught in Townsville and in Cairns was examined, but no plague infection was discovered. One infected rodent was found in the Hinchinbrook Shire.

The work of catching and examining rats in Sydney has been continued. On January 17, 1922, an infected rat was found in Sussex Street and on the following day an infected rat was found in Kent Street.

In Victoria, Tasmania, South Australia and Western Australia small numbers of rats were caught during the period covered by the report, but none was found to be infected.

Plague on Vessels.

The steamship *Tango Maru* arrived at Thursday Island on December 31, 1921, from Kobe, Nagasaki, Hong Kong, Manila and Zamboanga. A third-class passenger who joined the ship at Hong Kong was taken ill during the voyage. An inguinal bubo developed and was subsequently found to be associated with some bacillary infection. The case was regarded as one of plague. Special means were taken to deal with the vessel, its contents and the passengers. No infected rodents were discovered after thorough fumigation. Up to the time of issuing the report there was no spread of the infection.

Correspondence.

THE PROPHYLAXIS OF VENEREAL DISEASES.

SIR: In the report of the interesting discussion on this subject, references have been made to certain phases of this subject with which I have been associated. May I therefore briefly make comment?

(*i.*) The so-called packet system was not a failure in the Australian Imperial Force in Egypt. It was to some extent used there with full explanation and written instruction and when tested was found to be remarkably successful.

(*ii.*) I have never ignored the moral problem, but have consistently objected to the mixing of the moral with the medical.

As perhaps a majority of those infected are not responsible for the acquisition of these diseases, I regard the action of moralists who try to block prophylaxis as nearly criminal. Medical men rather more than most people respect and appreciate clean living, because they know what vice means. They are not, however, professors of morality, but are concerned with the prevention and treatment of disease. As citizens their sympathies must be with moral ideals.

When asked for advice by the authorities in Egypt, I

advised the institution of an energetic moral and prophylactic campaign, but by separate and independent agencies, *viz.*, the chaplains and the medical officers.

(*iii.*) I have not expressed the "opinion" that alcohol has little to do with the causation of venereal diseases. Formerly I thought it had.

I quoted the result of investigations made at Langwarrin, which showed that the great majority of the infected had not been alcoholic when risking exposure.

In the absence of other evidence I am unable now to assert that alcohol is an important causative factor.

The report of the proceedings of the New South Wales Branch must be most gratifying to all those who realize that the medical profession is now really moving and is prepared to publicly face the facts.

Yours, etc.,

JAMES W. BARRETT.

(Undated.)

Books Received.

THE PREVENTION OF MALARIA IN THE FEDERATED MALAY STATES: A RECORD OF TWENTY YEARS' PROGRESS, by Malcolm Watson, M.D., C.M., D.P.H., with contributions by P. S. Hunter, M.A., M.B., D.P.H., and A. R. Wellington, M.R.C.S., L.R.C.P., D.P.H., D.T.M. & H., and a preface by Sir Ronald Ross, K.C.B., K.C.M.G., F.R.C.S., D.P.H., M.D., LL.D., D.Sc., F.R.S., Nobel Laureate; Second Edition, Revised and Enlarged; 1921. London: John Murray; Sydney: Angus & Robertson, Limited; Demy 8vo., pp. 381, with 115 illustrations. Price: 42s. net.

THE HEART RHYTHMS, by Paul Dudley Lamson, M.D., Associate Professor of Pharmacology, Johns Hopkins University; 1921. Baltimore: Williams & Wilkins Company; Demy 8vo., pp. 100, with 52 figures. Price: $2.60.

Medical Appointments.

DR. J. E. FOLEY (B.M.A.) has been appointed Deputy Licensing Magistrate for the Cowra Licensing District, New South Wales.

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DR. D. R. C. TREGONNING (B.M.A.) has been appointed a Justice of the Peace for the Perth Magisterial District, Western Australia.

* * * *

DR. I. GEORGE (B.M.A.) has been appointed District Medical Officer and Public Vaccinator at Esperance and Chairman of the Esperance Boat Licensing Board, Western Australia.

* * * *

DR. D. S. MACKENZIE (B.M.A.) has been appointed Chief Resident Medical Officer at the Perth Hospital, Western Australia.

* * * *

DR. K. F. VICKERY (B.M.A.) has been appointed Deputy Quarantine Officer at Newcastle, New South Wales.

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DR. W. C. SAWERS has been appointed Quarantine Officer in South Australia.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii..

ALFRED HOSPITAL, MELBOURNE: Vacancies on the Medical Staff.

COMMONWEALTH PUBLIC SERVICE: Quarantine Officer, Western Australia.

WONDAI DISTRICT HOSPITAL, QUEENSLAND: Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary. 3, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, 6, Bank of New South Wales Chambers, St. George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

FEB. 14.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 21.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
FEB. 21.—Illawarra Suburbs Medical Association, New South Wales.
FEB. 22.—Victorian Branch, B.M.A.: Council.
FEB. 23.—South Australian Branch, B.M.A.: Branch.
FEB. 23.—Brisbane Hospital for Sick Children: Clinical Meeting.
FEB. 24.—Queensland Branch, B.M.A.: Council.
FEB. 24.—Central Southern Medical Association, New South Wales.
FEB. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
MAR. 1.—Victorian Branch, B.M.A.: Branch.
MAR. 3.—Queensland Branch, B.M.A.: Branch.
MAR. 7.—New South Wales Branch, B.M.A.: Ethics Committee; Executive and Finance Committee.
MAR. 8.—Western Australian Branch, B.M.A.: Council.
MAR. 10.—Queensland Branch, B.M.A.: Council.
MAR. 10.—South Australian Branch, B.M.A.: Council.
MAR. 14.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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